

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. LXV: No. 18.

New York, Thursday, May 3, 1900.

\$5.00 a Year, including Postage.
Single Copies, Ten Cents.

Reading Matter Contents.....	page 53
Alphabetical Index to Advertisers ..	179
Classified List of Advertisers.....	181
Advertising and Subscription Rates ..	61



SHULTZ PATENT SABLE
RAWHIDE BELTING
Also LEATHER, RUBBER, PATENT, POLYMER, COVER, BELT, BREASTING, AND BELT CEMENT.
DYNAMO BELTING, New York, Phila.
St. Louis, Mo. Boston.

WRITE REPUBLIC IRON & STEEL CO., AT CHICAGO, CLEVELAND, CINCINNATI, BIRMINGHAM, ST. LOUIS, ST. PAUL, BUFFALO, OR NEW YORK, WHEN IN NEED OF IRON AND STEEL BARS, PLATES, ANGLES, CAR AXLES, SPIKES, BOLTS AND NUTS, ETC., AND GET "REPUBLIC" QUALITY AND PROMPT SERVICE.



THE BRISTOL COMPANY
Waterbury, Conn.
Bristol's Recording Instruments,
For Pressure, Temperature and Electricity.
All Ranges, Low Prices and Guaranteed. Send for Circulars.

SAMSON SPOT CORD

Also Massachusetts and Phoenix Brands of Sash Cord.
SAMSON CORDAGE WORKS, - Boston, Mass.



TURNBUCKLES.
BRANCH OFFICE: 11 Broadway, New York.
Cleveland City Forge and Iron Co., - Cleveland, O.
TURNBUCKLES.
MERRILL BROS.,
465 to 471 Kent Ave.,
Brooklyn, E. D., N.Y.

BESSEMER PIG.
PILLING & CRANE
Girard Building, Philada.
Lewis Block, Pittsburgh.

American Sheet Steel Company
Manufacturers of Black and Galvanized Sheets
Battery Park Building
New York

Grand American Handicap, 1900,

WON BY

The Union Metallic Cartridge Co.'s Machine Loaded Shells.

NOTE THESE FIGURES TAKEN FROM OFFICIAL RECORD:

Number of Shooters Facing Traps,	211
Number of Shooters using U. M. C. Shells,	118
Number of Shooters using Shells made by six other Manufacturers,	93 211
Number of Shooters making straight scores,	8
Of this number seven used U. M. C. Shells, winning \$2,113.75.	

Comments are hardly necessary. Ask for U. M. C. Machine Loaded Shells and send for List.

The Union Metallic Cartridge Co.,
BRIDGEPORT, CONN.

CAHALL BOILERS See Page 118.

CAPEWELL HORSE NAILS.

NEW YORK,
PHILADELPHIA,
CHICAGO,
ST. LOUIS,
BOSTON,
DETROIT,
CINCINNATI,
SAN FRANCISCO,
PORTLAND, ORE.,
BUFFALO,
BALTIMORE,
NEW ORLEANS.

BRANCHES:

THE CAPEWELL HORSE NAIL COMPANY,
HARTFORD, CONN.



WE CLAIM THE FOLLOWING MERITS FOR JENKINS BROS.' VALVES.

1. Manufactured of the best Steam Metal.
2. No regrinding, therefore not constantly wearing out the Seat of the Valves.
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam, Oil, and Acids.
4. The Easiest Repaired, and all parts interchangeable.
5. Every Valve Tested before leaving the factory.
6. ALL GENUINE stamped with Trade Mark.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

Brass Prices High, So Use Bright "Swedoh" Stamp- ing Steel, Easily Brass Plated and Save Money. **See page 167**



MAGNOLIA METAL

Best Anti-Friction Metal for all Machinery Bearings. Beware of Imitations. Genuine Magnolia Metal is made up in bars of which this is a fac-simile:

The name and trade-box and bar, and the in United States" and are stamped on the un-

Magnolia Metal is still selling at the same price it has always sold at—No advance.

MAGNOLIA METAL CO., 266 & 267 WEST ST., NEW YORK.

Chicago Office, Fisher Building, 261 Dearborn St.
Cleveland, 15 South Water Street.

THE
ANSONIA BRASS
AND **COPPER CO.**
MANUFACTURERS OF
BRASS AND COPPER
Seamless Tubes, Sheets, Rods and Wire.

Ingot Copper.

SOLE MANUFACTURERS
Tobin Bronze
(TRADE-MARK REGISTERED.)

Condenser Plates, Pump Linings, Round,
Square and Hexagon Bars, for Pump
Piston Rods and Bolt Forgings.

89 John Street, - - New York.

Randolph-Clowes Co.,

Main Office and Mill,
WATERBURY, CONN.

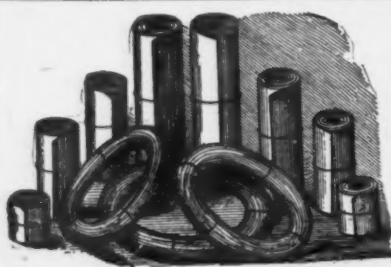
MANUFACTURERS OF

SHEET BRASS & COPPER.

**BRAZED BRASS & COPPER
TUBES.**

**SEAMLESS BRASS
& COPPER TUBES
TO 36 IN. DIAM.**

New York Office, 253 Broadway, Postal Tel-
egraph Bldg., Room 202.
Chicago Office, 602 Fisher Bldg.
Boston Office, Cor. Oliver and Purchase Sts.



Waterbury Brass Co.

Established 1845.

Sheet, Roll and Platers' Brass,

German Silver, Copper, Brass and Ger-
man Silver Wire, Brass and
Copper Tubing.

COPPER RIVETS AND BURS.

TAPE MEASURES,

METALLIC EYELETS,

Brass Kettles, Brass Tags, Powder Flasks,
Shot Pouches, &c.,

AND SMALL BRASS WARES OF EVERY DESCRIPTION.

**Cartridge Metal in Sheets or Shells
a Specialty.**

DEPOTS:

60 Centre St., New York. 125 Eddy St., Provi-
dence, R. I. 38 Mechanic St., Newark, N. J.
MILLS AT WATERBURY, CONN.

Deoxidized Genuine Babbitt

used by United States Govern-
ment in some of FASTEST
TORPEDO BOATS. Write us
about it.

Bridgeport Deoxidized Bronze & Metal Co.,
BRIDGEPORT, CONN.

THE PLUME & ATWOOD MFG. Co.,
MANUFACTURERS OF
Sheet and Roll Brass
—AND—
WIRE

PRINTERS' BRASS, JEWELERS' METAL, GERMAN
SILVER AND GILDING METAL, COPPER RIVETS
AND BURS.

Fine, Brass Butt Hinges, Jack Chain, Kero-
sene Burners, Lamps, Lamp
Trimnings, &c.

39 MURRAY ST., NEW YORK.

144 HIGH ST., BOSTON.

199 LAKE ST., CHICAGO.

ROLLING MILL:
THOMASTON, CONN.

FACTORIES:
WATERBURY, CONN.

SCOVILL MFG. CO.,
Manufacturers of

BRASS

SHEET, WIRE, TUBES,
Hinges, Buttons, Lamp Goods,
Nipples, Pumps and Oilers
for Bicycles, Braziers'
Soldier.

Factories, WATERBURY, CONN.

DEPOTS:
New York, Chicago, Boston.

JOHN DAVOL & SONS,

AGENTS FOR

Brooklyn Brass & Copper Co.,

DEALERS IN

**COPPER, TIN, SPELTER,
LEAD, ANTIMONY.**

100 John Street, - - New York.

ARTHUR T. RUTTER,

SUCCESSOR TO

WILLIAM S. FEARING,

256 Broadway, New York.

Sheet Brass, German Silver, Cop-
per Brass and German Silver
Wire, Brazed and Seamless
Brass and Copper Tubes, Small
Tubing a Specialty. Brass and
Copper Rods, Brass Ferrules.
Sheet and Ingot Copper; Spelter,
Tin, Antimony, Lead, etc.

THE BRIDGEPORT BRASS CO.,

BRIDGEPORT, CONN.

10 Murray St., New York.

85-87 Pearl St., Boston.

17 N. 7th St., Philadelphia.

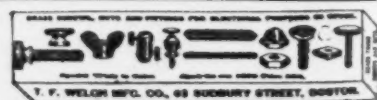
MANUFACTURERS OF

**Brass AND Copper { SHEET
TUBING
WIRE.**

Lamp Goods of all Kinds.

BRASS AND COPPER GOODS

In Great Varieties.



Matthiessen & Hegeler Zinc Co.,

LA SALLE, ILLINOIS,

SMELTERS OF SPELTER

AND MANUFACTURERS OF

SHEET ZINC AND SULPHURIC ACID.

Special Sizes of Zinc cut to order. Rolled Battery Plates.

Selected Plates for Etchers' and Lithographers' use.

Selected Sheets for Paper and Card Makers' use.

Stove and Washboard Blanks.

ZINCS FOR LECLANCHE BATTERY.

BRASS FOUNDERS FINISHERS J.J. RYAN & CO.

88-74 West Monroe St., Chicago.

Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS
On Short Notice.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest
work on any subject in which you are inter-
ested by addressing **DAVID WILLIAMS**
COMPANY, Publishers and Booksellers, 232-238 William St., N. Y.

HENDRICKS BROTHERS

PROPRIETORS OF THE

Belleville Copper Rolling Mills,

MANUFACTURERS OF

Braziers', Bolt and Sheathing

COPPER,

COPPER WIRE AND RIVETS.

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.
49 CLIFF ST. NEW YORK

ELEPHANT BRAND PHOSPHOR- BRONZE.



THE PHOSPHOR BRONZE SMELTING CO. LIMITED,
2200 WASHINGTON AVE., PHILADELPHIA.
"ELEPHANT BRAND PHOSPHOR-BRONZE"
INGOTS, CASTINGS, WIRE, RODS, SHEETS, ETC.
— DELTA METAL —
CASTINGS, STAMPINGS AND FORGINGS
ORIGINAL AND SOLE MAKERS IN THE U.S.

DELTA METAL

Illinois Zinc Company,

MANUFACTURERS OF

Spelter, Sheet Zinc, Sulphuric Acid and Acid Phosphate.

W. FISHER, Agent, 366 Washington St., New York City.
Telephone, 802 Franklin.

PERU, ILL.



OILLESS BEARINGS.

A strong letter of commendation from a firm whose reputation is "world wide" as the manufacturers of the celebrated "PEARLINE."

NORTH AMERICAN METALINE CO., 48 Third St., Long Island City, N. Y.
Gentlemen: Your favor of 20th inst. received; in reply are pleased to say that your Metalined Bushings have given us entire satisfaction. We first applied them in 1896 or '97 under very trying conditions, put them in fast running loose pulleys with high tension belt, and they gave perfect satisfaction. Since then, we have extended their use throughout our works, and they have given satisfaction wherever we have placed them.
Very truly yours,
JAS. FYLE & SONS.

**FOR great Tensile Strength, Elasticity and Elongation,
coupled with unusual Non-Corrosive qualities,**

CASTINGS AND PROPELLER WHEELS

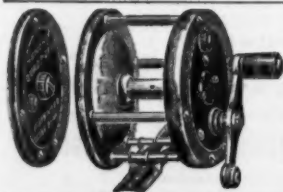
made from

PARSONS MANGANESE BRONZE

cannot be excelled. Write for particulars.

SOLE MAKERS:

**THE WILLIAM CRAMP & SONS SHIP and ENGINE BUILDING CO.,
PHILADELPHIA, PA.**



HENDRIX
Has sold 2,000,000 standard Fishing Reels in 12 years to Domestic and Foreign Jobbing trade and will mail you any Reel you may select from our illustrated catalogue on receipt of list price, and if not satisfactory will, on return of Reel refund the money. Catalogues mailed free on application.

THE ANDREW B. HENDRIX CO., NEW HAVEN, CONN.



Manufacturers all grades Babbitt Metals, Solder, Bar Tin, Bar Lead, Lead Car Seals, Pig Tin, Pig Lead, Antimony, Copper, Spelter, etc.

Best Anti-Friction Metal for all machinery bearings. For high speed and heavy crushing weight it has no equal.

THEO. HIERTZ & SON, Sole Manufacturers,
30th St. and Park Ave., St. Louis, Mo.
Antimony, Copper, Spelter, etc.

Bronze

We make a specialty of bronze tablets for buildings and monuments; also brass name plates for engines, dynamos and machinery.

Grey iron and aluminum castings of every description.

JOHN W. CLARK, - ALBANY, N. Y.

UNITED METALS SELLING COMPANY,

11 BROADWAY, NEW YORK.

EUROPEAN AGENTS:

C. S. HENRY & CO., - 12 Leadenhall St., London, E. C.

BABBITT.

WE MAKE
BABBITT METALS
ALL GRADES.

Merchant & Co., Inc.,

PHILADELPHIA. NEW YORK.
CHICAGO. BROOKLYN.

WRITE US ALWAYS.

HELWIG PNEUMATIC STAYBOLT CLIPPER

Cuts 1 1/4 inch and less staybolts rapidly; leaves cut straight and smooth; has inserted knives, replaced at small cost. Weight, 170 lbs.

HIGHLY RECOMMENDED BY PURCHASERS.

Patented and manufactured by HELWIG MFG. CO., St. Paul, Minn.

A

The American Metal Co.

(LIMITED),

Exchange Court Building, 52 Broadway, New York
P. O. BOX 957.

COPPER, COPPER ORES AND MATTES.

**Tin, Lead, Spelter, Antimony, Nickel,
Aluminum, Bullion, Iron.**

ADVANCES MADE ON CONSIGNMENTS.

AGENTS FOR

HENRY R. MERTON & CO., London, Birmingham,
Manchester and Glasgow.
METALLGESELLSCHAFT, Frankfurt-on-Main.
WILLIAMS, FOSTER & CO., Ltd., Swansea, Eng.
SOCIETE LE NICKEL, Paris, France.
BALBACH SMELTING & REFINING CO., Newark N. J.

PHOSPHOR-TIN

BY USING MY PHOSPHOR TIN MANUFACTURERS CAN MAKE ANY DESIRED GRADE OF PHOSPHOR BRONZE THEMSELVES. BY THE SIMPLE PROCESS OF MELTING MUCH CHEAPER THAN THEY ARE NOW TO BE HAD IN THE MARKET. NEW OR OLD COPPER CAN BE USED. FOR CIRCULARS AND PRICE ADDRESS **HALK & NAUMANN** NEW-YORK OFFICE SOLE AGENTS FOR THE U.S. AND CANADA 57 PEARL

THE CRESCENT Phosphorized Metal Co.

Philadelphia, Pa.

Manufacturers of High Grade
**Phosphor Tin,
Phosphor Bronze,
Phosphor Copper,
Manganese Copper.**

LOWEST MARKET PRICES.
CORRESPONDENCE SOLICITED.

U. I. HUNGERFORD BRASS AND COPPER CO.
Office and Salesroom, 121 North St., bet. Centre & Elm Sts.
Warehouse and Shipping Dept. (Annex), 57 and 59 Elm St.
NEW YORK.
TELEPHONE, 2144 FRANKLIN.

WE HAVE A LARGE AND VARIED ASSORTMENT OF
BRASS AND COPPER
IN SHEETS, RODS, TUBES, WIRE,
RIVETS, TACKS, NAILS, ETC., ETC.,
ON HAND FOR PROMPT SHIPMENT

L. E. COCHRAN, PRESIDENT,

G. M. McKELVEY, V. PRES.

MASON EVANS, SECY & TREAS.

JOHN O. PEW, GENL. MGR.



SEND FOR CATALOGUE AND PRICES.



V. CRIMPED EDGE IRON.

**THE YOUNGSTOWN
IRON & STEEL ROOFING
COMPANY.**

IRON & STEEL WEATHER BOARDING.

 MANUFACTURERS OF ALL KINDS OF
IRON & STEEL ROOFING & SIDING.
 SPECIAL BRAND "MAHONING"

GALVANIZED & BLACK RIDGING.

YOUNGSTOWN, OHIO

Eastern Agents:

W. H. THOMSON & CO., Philadelphia, Pa.

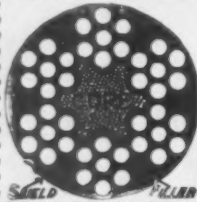
Chicago Office:

810-811 New York Life Bldg.

New "Cold" Process of Galvanizing.

In use for more than two years with best and absolutely satisfactory results. Articles that cannot be galvanized by any other process, such as screws, nuts, cutting instruments, tools of every description, springs, locks, artistic metal articles, can be galvanized in a superior manner by this process. The multitude of articles that can be galvanized is without limit. Uniformly smooth surface is preserved. Thickness of coating can be regulated, saving of spelter about 80%, besides many other advantages. We grant licenses for territory, also shop rights on royalty basis.

GALVANIZING DONE
AT OUR PLANTS.Jobbing Plant, 108-110 W. 11th St.
Main Office, 346 Broadway, N. Y.
U. S. Electro-Galvanizing Co.,
 348 Broadway, New York.

 Why Not **WIRE ROPES,**
 Preserve Your **MANILA ROPES,**


GEARING

WITH

"IRONSIDES"

Filler and Shield.

THE IRONSIDES CO.,
 Columbus, O., U.S.A.
 Catalogue T tells how.

ELECTRO GALVANIZING

ON ALL KINDS OF

Iron, Steel, Screws, Nails, also

Steam and Drainage Fittings.

EMPIRE PIPE BENDING AND SUPPLY CO.,235 to 253 Park Ave., **BROOKLYN, N. Y.**

Telephone "429 B Main."

BLACKMAN & KING,

ELECTRO GALVANIZING WORKS,

Specialty made of Galvanizing

Steam, Water, and Drainage Fittings,

Nails, Screws, Bolts and Nuts,

Springs, All Kinds of Castings and Wrought

Iron Work.

601 Greenwich St., Bet Jane and 12th Sts., New York

WIRE ROPE

FOR ALL PURPOSES.

IRON AND STEEL WIRE

OF ALL KINDS.

Wire Rope Tramways,

Cable Hoist Conveyors,

Hall Patent Excavating Cable Hoist Conveyor,

Surface and Underground Haulage Plants.

Wire Rope Power Transmission Plants,

Log-Skidding and Canal Towage Plants,

Suspension Bridges.

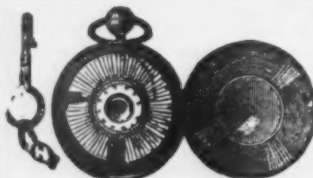
TRENTON IRON CO., Trenton, N. J.

New York Office—Cooper, Hewitt & Co., 17 Burling Slip. Chicago Office—1114 Monadnock Building.

BABBITT METAL FOR ROLLING MILL AND
 OTHER MACHINERY.
BRASS INGOTS and SPELTER.

Smelters and Refiners. Brand: GOLDEN ROD.

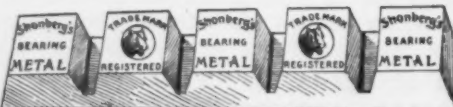
SCRAP METALS OF ALL CLASSES BOUGHT.

H. M. SHIMER & CO., - 1128 Cherry Street, PHILADELPHIA, PA.
Hahn's Latest Improved Watchman's Time Detector,

With Safety Lock Attachment.

Highest Award at Columbian Exposition.

This Clock is neat, thoroughly reliable and very durable. Cannot be tampered with. Price moderate. Is adapted to 6, 12 or 18 stations, having a different key for each. Registering is done by numbers from 1 to 6, 1 to 12 and 1 to 18, each station having its number. Send for circulars, prices and further particulars.

C. NANZ & CO., 127 Duane St., New York, U. S. A.
**Consumers and
Dealers**

 will do well to get my prices
 and samples of...

BEARING METAL

I. SHONBERG, MANUFACTURER,
 DEALER,

172 HUDSON STREET, - - - NEW YORK CITY.

Nickelized-Sheet-Zinc

(NICKELOID)

Is a highly polished, **NON-CORROSIVE** metal, packed with paper between each sheet. Is being used for Wash boards, House Numbers, Reflectors, Buttons, Name-plates, Stove-boards, Refrigerator Lining, Fruit Jar Caps. Can be soldered, stamped and bent to the sharpest turn, retaining a polish like nickel-plated brass.

Zinc Polished for the trade.

AMERICAN NICKELOID CO. PERU, ILLINOIS.

SCREENS OF ALL KINDS

Perforated Metals

of every description

THE HARRINGTON & KING PERFORATING CO.

CHICAGO ILL. U.S.A.

THE HARRINGTON & KING PERFORATING CO.

Main Office and Works, 209 North Union Street, Chicago, Ills.
Eastern Office, 284 Pearl Street, New York.

NEW HAVEN WIRE MFG. CO.,
MANUFACTURERS OF
WIRE
IN GREAT VARIETY.
NEW HAVEN, CONN.

WIRE AND SPRINGS
MORGAN SPRING CO.,
WORCESTER, MASS.

SMALL SPRINGS
OF EVERY DESCRIPTION
MADE BY
THE WALLACE BARNES CO.
BRISTOL, CONN., U.S.A.
ESTABLISHED 1857.

FLAT OR ROUND WIRE, STEEL OR BRASS
COLD ROLLED STEEL
KEPT IN STOCK, .003 TO .048 IN THICKNESS
SPRINGS ENAMELED OR PLATED
SEND SAMPLES AND WRITE FOR QUOTATIONS

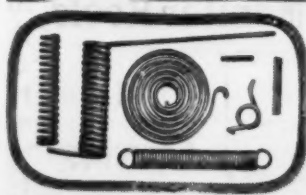
OIL TEMPERED SPRINGS
FOR ORGANS, PIANOS, GOVERNORS, BICYCLES, AND
AGRICULTURAL IMPLEMENTS AND SPECIAL
SPRINGS—MADE FROM CRUCIBLE SHEET STEEL
SABIN MACHINE CO. MONTPELIER, VT.

CLARK & COWLES
MANUFACTURERS OF
SPRINGS AND RIVETS
PLAINVILLE
CONN.

SPRING COTTERS and KEYS.
In 300 sizes in STEEL and BRASS.



BRIGHT IRON AND BRASS WIRE GOODS.
SPECIAL WIRE WORK TO ORDER. **M. S. BROOKS & SONS, CHESTER, CONN.** CATALOGUE SENT ON APPLICATION.



Compression, Extension and Torsion SPRINGS
of any size and shape and for any purpose.
ST. JOHNS SPRING CO.,
St. Johns, Mich.

COTTERS SPLIT KEYS RIVETED KEYS
ALL SIZES
THE HOLLINGER FENCE CO.
GREENVILLE, OHIO.

ENAMEL.

High grade enameling done on Sheet Iron, Steel and Cast Iron.

Enamel Signs for advertising purposes in all colors.

Street names and numbers a specialty.

Acid proof enamel for Chemical and Pharmaceutical apparatus.

Majolica enamel for ornamental cast iron work (new).

Special enamel for Electrical Heating apparatus.

BALTIMORE ENAMEL CO., No. 2
Allen, Clement, Porter and Stevenson Sts.,
BALTIMORE, MD.
General Enamellers.

GRISWOLD WIRE CO.,

MANUFACTURERS OF
Cross head, Improved, Monitor, Hook and Single Loop

STEEL WIRE BALE TIES.

Wire Straightened and Cut to lengths. Wire Wire Nails, etc.

BRADDOCK, PA.

JENCKES MFG. CO.,

PAWTUCKET, R. I.
CRESCENT COAT AND HAT HOOKS,
BRIGHT WIRE GOODS,
COTTERS AND KEYS,
SPECIAL WIRE WORK TO ORDER.

Sole Selling Agents, **JOHN H. GRAHAM & CO.,**
113 Chambers St., New York

Kinematics of Machinery. This little book is intended as a text book for use in the general course in mechanical engineering schools, or for use by draftsmen and others who may desire to study the methods of graphical analysis of machine motions. By **JOHN H. BARR**, Professor of Machine Design, Sibley College, Cornell University. 213 figures, 247 pages, 8vo, cloth, \$2.50
For sale by David Williams Co., 232 William St., N.Y.

R. H. WOLFF & CO., Ltd.,

MANUFACTURERS OF

ALL FINE GRADES OF COLD ROLLED STEEL

For Corset, Band Saws, Clock and Watch Springs and all parts thereof, and all other special purposes.

FINEST QUALITIES OF STEEL WIRES

Round, Square, Flat and all other shapes, for Cables, Wire Ropes, Spokes, Needles, Piano Wire, and all other special purposes, tempered and untempered, etc.

Also Makers of
Wolff-American High Art Cycles.

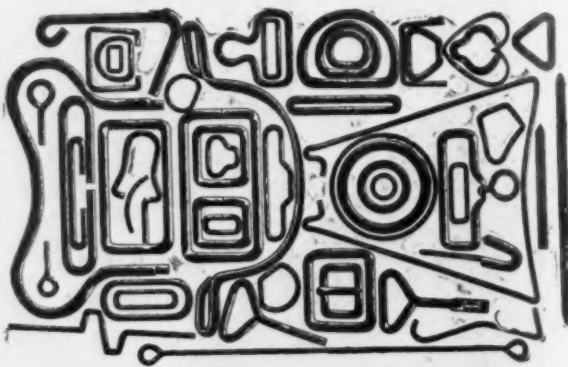
Works, 118th, 117th and 116th Sts. and East River,

NEW YORK CITY.



WE make all kinds of
Sheet Metal goods
as well as Wire goods.
All our work is done by
Automatic Machines,
and consequently cheap
in price and good in
quality.

R. C. JENKINSON & CO.,
289-297 Washington St.,
NEWARK, N. J.



A few of the Wire shapes we have made.

"AMERICAN"

TRANSMISSION

THE
AMERICAN
MANUFACTURING
COMPANY,
65 Wall Street, NEW YORK.

"A LITTLE BLUE BOOK ON
ROPE TRANSMISSION,"
Second Edition—AUGMENTED.
Published by
THE AMERICAN MANUFACTURING CO.

ROPE.

Established 1845.
DUNBAR BROTHERS,
MANUFACTURERS OF
Steel (Oil Tempered) Springs
ALL KINDS OF
SMALL SPRINGS
MADE FROM
SHEET STEEL and
STEEL and BRASS WIRE,
BRISTOL, CONN.

WM. McFARLAND,
IRON FOUNDER,
TRENTON, - N. J.
CHILLED CAST WIRE DIES
A SPECIALTY.
Any Size or Style Made at Short Notice.

The Engineer's Friend. Containing information
about the locomotive, steam engine, with ques-
tions and answers for engineers and other val-
uable tables, for engineers, firemen, etc. By J.
FERRYCOCK. Illustrated. 88 pages, paper.....50c.
For sale by David Williams Co., 232 William St., N.Y.

WATERBURY ROPE CO.

FACTORIES, Brooklyn.

OFFICE, 69 South St., N. Y.

MAKERS OF

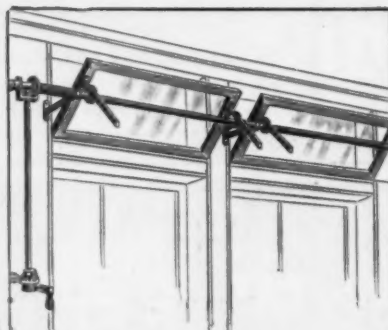
WIRE ROPE

OF ALL KINDS.

Also Manila, Sisal, Russia and
American Cordage and Binder Twine.

For Operating Windows in Monitor Roofs,

Transoms
and
Sky Lights



in
Churches
and
Schools.

Melrose, Mass.

S. E. A. ORMSBY,

MACHINESHOPS.

**SUCCESSFUL
SANITARY VENTILATION**
Can now be accomplished.

NATIONAL WIRE AND VENTILATOR WORKS
HOWARD & MORSE.
45 FULTON ST. NEW YORK CITY
MANUFACTURERS OF EVERY VARIETY OF

WIRE CLOTH, WIRE WORK
AND
ARTISTIC METAL WORK.
ALSO
MECHANICAL VENTILATING APPLIANCES
INCLUDING
BLACKMAN'S PATENT
POWER VENTILATING WHEEL
AND
THE PATENT HIGH SPEED
SOLANO STEAM ENGINE.

EXCLUSIVE MANUFACTURERS OF THE Heavy Steel Tempered
National Battery and Bolting Wire-Cloth.

UNIFORM BUILDING VENTILATION
Can now be Guaranteed.

BRODERICK & BASCOM ROPE CO.,
SOLE MANUFACTURERS OF

Established 1876.

"PATENT STEEL" ROPE.

THE MOST DURABLE ROPE MADE; IT HAS NO EQUAL.
SEND FOR ILLUSTRATED CATALOGUE.

St. Louis, Mo.

A. LESCHEN & SONS ROPE CO.,
Manufacturers of
PATENT FLATTENED STRAND WIRE ROPE.
FINLAYSON WIRE ROPE
Tramway.
AND ALL KINDS OF
WIRE ROPE,
Manila, Sisal, Blocks, Etc.
The only satisfactory Tramway on the market.
Estimates Given on Application.
920-922 North Main Street, ST. LOUIS, MO.
Branch Office, 47-49 South Canal St., Chicago, Ill.

1848. **ESTABLISHED** **1848.**

WIRE ROPE
HAZARD MFG CO.

INSULATED WIRES and CABLES. HARD and SOFT DRAWN COPPER WIRE.
Warehouses: 50 DEY STREET, NEW YORK. Works: WILKESBARRE, PA.

WILLIAMSPORT WIRE ROPE CO.,
WILLIAMSPORT, PA.



OF ALL KINDS AND SIZES AND FOR ALL PURPOSES.

THE STEWART WIRE COMPANY. - - Office and Works, EASTON PENNA.

BRIGHT
ANNEALED
COPPERED
TINNED

— ALL SIZES —
WIRE
— ALL VARIETIES —

LIQUOR
BRIGHT
SPRING
SCREW
RIVET

Wire Straightened and Cut to Specified Lengths.

**HOWSON
AND
HOWSON**

Counsellors at Law,
Solicitors of Patents.

PHILADELPHIA
West End Bldg., 32 So. Broad St.
NEW YORK
Potter Building, 38 Park Row,
WASHINGTON
National Union Bldg., 918 F St.

PATENTS

U. S. and Foreign Secured.

Trade Marks and Copyrights. **Twenty Years' Experience.** Send model or sketch and brief description of your invention and secure report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents," Free.

PATENT PRACTICE EXCLUSIVELY.
References Furnished on Application.

E. B. STOCKING, Attorney at Law,
611 F ST., N. W., WASHINGTON, D. C.

PATENTS.
GEO. R. HANLIN, Patent Lawyer,
800 H Street, N. W., Washington, D. C.
Booklet, "Information for Inventors," free.
Moderate Charges. Easy Payments.

GOEPEL & RAEGENER

Counselors at Law,
Registered Patent Agents,

290 BROADWAY, - Dun Building, - NEW YORK.

Special experience in and connections for obtaining Patents in foreign countries.

Estey Wire Works Co.

65 FULTON ST., NEW YORK.

Manufacturers of every variety of

WIRE CLOTH AND WIRE WORK

Bank and Office Railing,

BRASS AND IRON WORK,
RIDDLES AND SCREENS.

SEND FOR CATALOGUES.

JANNEY, STEINMETZ & CO.
Seamless Cold Drawn Steel Shells, Cylinders and Tanks, for Air, Water, Steam, Gas, Soda, Ammonia or Fluids under pressure and explosives.
Seamless Tubing, Heavy Section Tubes, Hydraulic Forgings for Cream Separator Bowls.
INGOT ALUMINUM for STEEL MAKERS,
DREXEL BUILDING,
PHILADELPHIA.

READING SCREW CO.,
SUCCESSORS TO NORRISTOWN WIRE CO.,
MANUFACTURERS OF

WIRE in Steel
Norway Charcoal Iron
FOR ALL PURPOSES.
NORRISTOWN, PA.

THE

WIRE GOODS COMPANY

Worcester, Mass.

Hardware and Kitchen Wire Goods.
Specialties to Order.

EVERYTHING IN WIRE.

The U. S. Wire Mat...

The cut shows a 50 ft. roll of our Wire Matting, from which the dealer can cut any length mat to suit his customer.....

To clean your feet on a U. S. Wire Mat, all you have to do is—walk on it. To clean the mat, all you have to do is—pick it up.

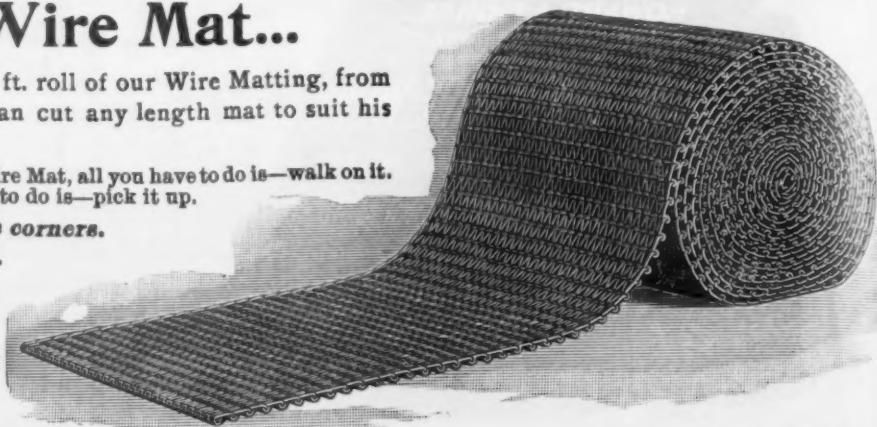
It does not curl up at the corners.

It does not hold the dirt.

It rolls up like a carpet.

It is made in all widths.

Write for our
Booklet.



UNITED STATES WIRE MAT CO., - - Decatur, Ills.

WE WANT AGENTS,

Hardware Dealers,
Implement Dealers
and others to handle
and sell our

IRON FENCE



*We furnish first-class work at prices
that bring the trade.*

We are the largest manufacturers
of Plain and Ornamental Iron Fence
in the United States.

We also manufacture Architectural
and Ornamental Iron Work, Jails, etc.

WRITE FOR CAT. NO. 33 GIVING SPECIAL DISCOUNTS.

THE STEWART IRON WORKS,
CINCINNATI, OHIO, U. S. A.



Elevator Cabs and Enclosures.

Brass Wire and Iron Rail-
ings in plain or fancy
designs.

Wire and Wrought Iron
Fences and Window
Guards.

WRITE FOR CATALOGUE.

The Ludlow-Saylor Wire Co.
ST. LOUIS, MO.

BOOKS.

YOU CAN OBTAIN PROMPTLY the latest
work on any subject in which you are inter-
ested by addressing **DAVID WILLIAMS**
COMPANY, Publishers and Booksellers, 232-238 William St., N. Y.

HIGHWAY BRIDGE
AT THOMPSONVILLE, CONN.



BOILER SHOP
FOR DICKSON MFG CO.
SCRANTON, PA.



THE Berlin IRON BRIDGE COMPANY

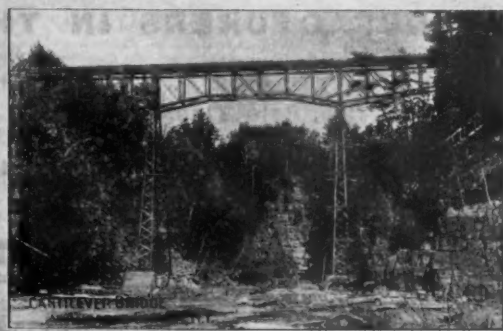


East Berlin
Conn.



FACTORY, JEROME & STEVENSON
MACHINE WORKS, CONN.

CHAS. M. JARVIS
PRESIDENT
Geo. H. SAGE, Secy & Supl
F. L. WILCOX, Treasurer
D. E. BRADLEY, Mngg
Contracting Dept.
JAS. H. EDWARDS,
Chief Engineer



CANTILEVER BRIDGE

NEW YORK OFFICE
718 BENNETT BLDG
COR FULTON & NASSAU STS.
BOSTON OFFICE
200 EQUITABLE BLDG
PHILADELPHIA OFFICE
1215 STEPHEN GIRARD
BUILDING



ROLLING MILLS
FOR WATERBURY BRASS CO.
WATERBURY, CONN.



MACHINE SHOP,
FULLER IRON WORKS
PROVIDENCE, R.I.

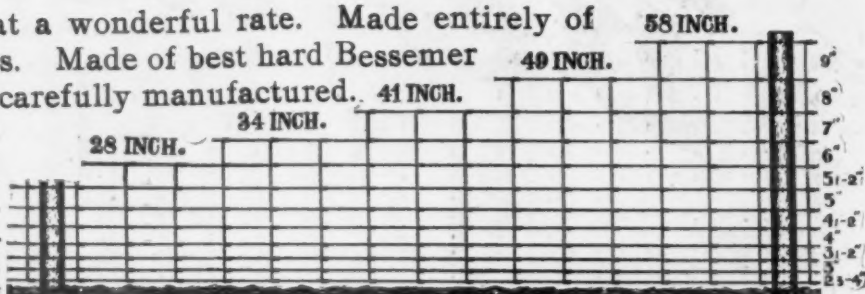
American Steel and Wire Co.

SOLE MANUFACTURERS OF

AMERICAN ALL HARD STEEL

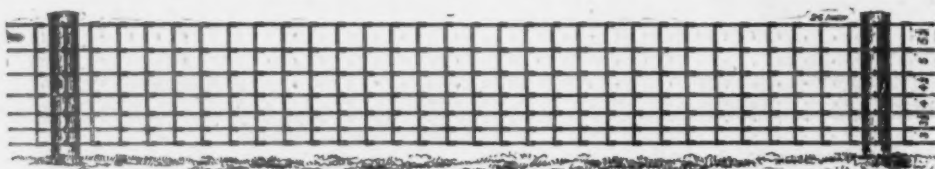
WOVEN WIRE FENCING.

Sales increasing at a wonderful rate. Made entirely of large, strong wires. Made of best hard Bessemer Steel. Well and carefully manufactured. Thoroughly durable and efficient. Economical. Am-
ply provides for expansion and contraction.



American Field Fence, Regular Style. Stays 12 inches or 6 inches apart.

Every Rod of American Fence Guaranteed



Special Hog Fence, 26 inches high.

LARGEST MANUFACTURERS IN THE WORLD

of Plain Wire, Barb Wire, Wire Nails, Brads and Staples, Poultry Netting, Baling Wire, Bale Ties, Etc.

Also Sole Manufacturers of the Celebrated

**BAKER
PERFECT**



**BARB
WIRE.**

Exclusive agency for the "American" Fences given to one live, wide-awake dealer in every town. This agency is valuable—write for it.

CHICAGO.

SAN FRANCISCO.

NEW YORK.

CONTINUOUS MILLS

FOR BILLETS, MERCHANT BAR, RODS,
HOOPS, AND COTTON-TIE.

WIRE-DRAWING MACHINERY---FOR STEEL, COPPER OR BRASS.

MORGAN CONSTRUCTION COMPANY,
WORCESTER, MASS., U. S. A.

MODERN
WIRE, WIRE NAIL AND CHAIN
PLANTS.

Designed and built
complete by

The Turner, Vaughn & Taylor Co., CUYAHOGA FALLS,
OHIO, U. S. A.

Cable Address:

"Vaughn, Cuyahoga Falls, O."

A. B. C. CODE USED.



LAWN FENCE,
WINDOW GUARDS,
OFFICE RAILING,
TREE GUARDS,
FARM FENCE.

Send for Catalogue and
Discount Sheet.

UP-TO-DATE MFG. CO., - TERRE HAUTE, IND., 959 No. Tenth Street.



ADAM'S STEEL and IRON WORKS

Ornamental Steel Fencing, Woven Wire Fencing.

Door and Window Guards, Bank Work, Jail Work, etc.

SEND FOR CATALOGUE.

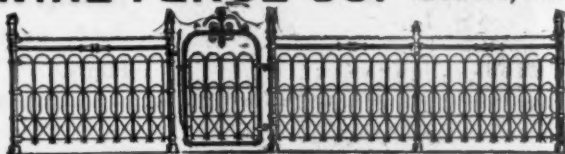
W. J. ADAM, - - Joliet, Ill.

DWIGGINS WIRE FENCE CO. Anderson, Ind.

Wire Fencing, Ready Made,
for

Lawn, Farm and Railroad.

Write for Catalogue.
Agents Wanted.



Manufacturers of
Barbed Wire Sta-
ples.

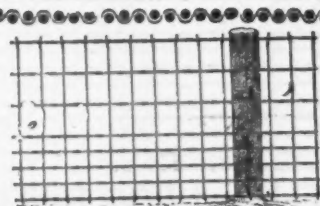
Steel Wire Nails.
Steel Bale Ties.

Annealed, Bright
and Galvanized
Market Wire.

Woven Wire Fence
Copper, Iron and
Steel Rods.

Special Wires and
Wire Straightened
and cut to length.

DILLON-GRISWOLD WIRE CO.,
STERLING, ILLS.



Kilmer's Stock or Hog Fence.

Strongest and will last the longest. It per-
fectly adjusts itself over hilly or uneven
ground. The only Stock Fence manufactured
that will absolutely overcome expansion or
contraction, therefore will not break, sag, or
get loose. Agents wanted in every country.
We also manufacture Wire Lawn Fencing, Bale
Ties, Nails, Etc. Write for catalogue.
KILMER WIRE MFG. CO., Chicago.

H. P. & H. F. WILSON,
MANUFACTURERS OF
WIRE BALE TIES

For Baling Hay, Straw, Jute, Moss, Rags, Paper
Stock and all Compressible Material,
177-579 Tenth Ave., - New York City.



IRON & WIRE FENCING.
ELLIS & HELFENBERGER,
200 SENATE, - INDIANAPOLIS IND.

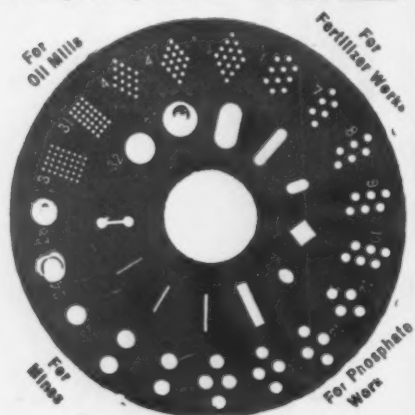
Hard Colled Galvanized Steel Wire for Fencing.



We make and sell in the roll to the hardware trade
Hard Galvanized Colled Wire for farm fence
purposes. Has twice the strength of soft wire; the coil
perfectly provides for expansion and contraction, and
costs about the same as the soft.

THE FROST WIRE FENCE CO.,
Welland, Ont., Canada. Cleveland, O.
WIRE FENCE. COILED WIRE. STEEL GATES.

PERFORATED METALS.

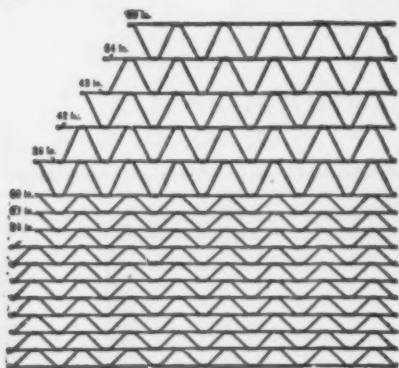


Grain and Seed Cleaning.

ERDLE & SCHENCK, - Rochester, N. Y.

If interested send for free metal sample.

"Hartman" "Stocade"



FIELD and HOG FENCE.

HARTMAN MFG. CO.
of Ellwood City, Pa.Garry Iron and
Steel Roofing Co.Roll Roofing.
Corrugated
Covering.
Standing
Seam Roofing.
Steel Brick
Siding.
Metallic
Shingles.
Shutters.Cor. Coe and Lake Sts.,
CLEVELAND, OHIO.THE GEO. W. STANLEY CO.,
BELLEVILLE, ILLS.,Makers of BARBED BLIND STAPLES,
Wire Nails and Brads.

SMALL NAILS and DOUBLE POINT TACKS.

E. T. BARNUM,

DETROIT, MICH.

ART METAL WORK

FOR ALL PURPOSES.

WIRE, IRON and BRASS WORK

OF EVERY DESCRIPTION

SEND FOR CATALOG

and describe your wants, we can
make it to please you.

WIRE SIGNS.

BANK
AND
OFFICE
OUTFITS

A SPECIALTY.



ORNAMENTAL GATES.

SEND FOR CATALOGUE.

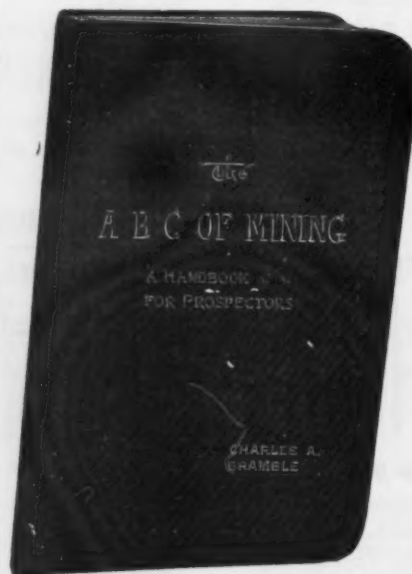
Automatic Micrometer Gauge for
Rolling Hot Plates.

AMERICAN AND FOREIGN STANDARDS.

HAINES GAUGE CO.,

156 West School Lane,
Germantown,

PHILADELPHIA, PA., U.S.A.

TREATING Fully of Explora-
tory and Preparatory Work,
of The Physical Properties of Ores,
Field Geology, Occurrence and
Association of Minerals, Chemical
Analysis, Blow-pipe Tests, Working
Deposits, Quartz and Hydraulic
Mining, Placer Mining, with Ad-
denda on Camp Life and Medical
Hints.

183 PAGES, CLOTH.

ONE DOLLAR-POSTPAID.

DAVID WILLIAMS COMPANY,

232-238 William St., N. Y.

NUT & WASHER MFG. CO.,
Milwaukee, Wis.

MANUFACTURERS OF

Wrought and Steel Plate Washers,
Felloe Plates, Burrs, &c.

CORRESPONDENCE REQUESTED.

EXPANSION BOLTS.

The Best Bolt
on the Market.

MFD. BY

THE McCABE HANGER MFG. CO.

533-543 West 22d St., N. Y.
WRITE FOR PRICES.

"DIAMOND" EXPANSION BOLT.



ONLY 2 PARTS.

Simplest Expansion Bolt in the market.
HENRY B. NEWHALL, 26 Cortlandt St., N.Y.
Tel. 924 Cortlandt.
925.



==== M. M. S. ====

POULTRY FENCING

is so pre-eminent superior to all others, that every dealer will handle it when he learns its real merit. It leads in quality, strength, service and economy. Requires few posts and no top or bottom rail. Does not sag or bag, and is easily and quickly erected. Saves 50 per cent. in cost of completed fence. We constantly carry in stock over 220 different styles, heights, weights and kinds of woven wire fencing. **A LARGER VARIETY THAN ALL OTHERS COMBINED.**



Patented July 31, 1894.

Trade Mark.

Patented July 6, 1897.

DEKALB FENCING

is especially adapted to the most exacting service under all conditions. Write for free catalogue, describing our full line of Steel Web Picket Lawn Fence, Cabled Field and Hog Fence, Steel, Wood and Pipe Frame Gates, Posts, etc.

BRANCH OFFICES:

Kansas City, Mo.
San Francisco, Cal.

SELLING AGENTS:

Rotherham, Wood & Co.
Melbourne, Australia.

DEKALB FENCE CO.

No. 327 High Street,

DeKalb, Ills., U. S. A.

Registered Cable Address: "DEKFENCE CHICAGO."

Codes used A, B, C, 4th Edition and Western Union.



Wire Cloth, Netting, Fencing and Perforated Metal.

We Manufacture a Complete Line of these Goods, Including

"CLINTON" Brand.

Painted Window Screen Cloth.
Galvanized Poultry Netting.
Wire Lath. Woven Wire Fence.
Electrically Welded Wire Fence.

"SILVER FINISH" Brand.

Galvanized Poultry Netting.
Galvanized Window Screen Cloth.
Galvanized Fruit Drying Cloth.

PERFORATED METAL FOR Coal, Ore and Gravel Screens, Spark Arresters, Kiln Floors, Filter Press Plates, Centrifugal Machines, Fanning Mills, Etc., Etc.

CLINTON WIRE CLOTH CO.,

CLINTON, MASS.

BOSTON.

NEW YORK.

CHICAGO.

SAN FRANCISCO.

WIRE CLOTH, NETTING.

Pearl Wire Cloth.
Galvanized Steel Wire Cloth.
Galvanized Wire Poultry Netting.
"Cottage" Lawn and Garden Fencing.
"G & B" Web Wire Fencing.
Sieves, Riddles, Screens.
Gilbert's Rival Ash Sifter.
House Furnishing Wire Goods.

The Gilbert & Bennett Mfg. Co.

FENCING. GATES, FENCING TOOLS.
STABLE FIXTURES, RAILINGS, WINDOW GUARDS.
WIRE LATHING WITH HAMMOND'S METAL FURRING.
THE OLDEST AND LEADING MANUFACTURERS OF GALVANIZED WIRE GOODS IN AMERICA.

WIRE GOODS, WIRE WORK.

44 Cliff Street,
NEW YORK.
153 Lake Street,
CHICAGO.
Factories: Georgetown, Conn.
Wireton (three miles from Chicago), Ill.
Established 1818.

WRIGHT & COLTON WIRE CLOTH CO.



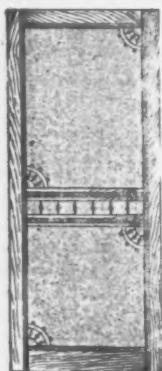
POULTRY NETTING. All meshes and sizes wire. Galvanized "Before" and "After" weaving.

WIRE CLOTH. Galvanized, Tinned and Black Brass and Copper. Rust Proof.

WIRE. Annealed, Bright, Coppered, Tinned and Galvanized. Cold Rolled. Riddles, Coal and Sand Screens, Galvanized Clothes Lines, Conductor Strainers, etc. Wood Screws.

Factories: { Palmer, Mass.
Worcester, Mass.

GENERAL OFFICE, Worcester, Mass.
WAREHOUSE, 79 Lake St., Chicago.



Pennsylvania Wire Works, EDWARD DARBY & SONS,

233-235 Arch St., PHILA., PA.

MANUFACTURERS OF

Adjustable Window Screens and Screen Doors,

Painted Window Screen Wire Cloth, Galvanized Poultry Wire Netting, Brass, Copper, Steel, Iron and Galvanized Wire Cloth.

SEND FOR CATALOGUE AND PRICES.

PAINTED AND GALVANIZED WINDOW SCREEN CLOTH.

IRON, STEEL, BRASS AND COPPER WIRE CLOTH.

MANUFACTURERS
**THE ROEBLING
STANDARD
WIRE
LATHING.**

TRENTON,

NEW JERSEY.

117 and 119 LIBERTY STREET,

NEW YORK.

171 and 173 LAKE STREET,

CHICAGO.

**"JERSEY"
POULTRY
NETTING
AND FARM
FENCING.**

25 and 27 FREMONT STREET,

SAN FRANCISCO.

**- NEW JERSEY -
WIRE CLOTH CO.**

WICKWIRE BROTHERS, CORTLAND, N. Y.

MANUFACTURERS OF

WIRE CLOTH AND NETTINGS.

CORTLAND Painted Wire Cloth, **WICKWIRE** Bronze Wire Cloth, **WHITE METAL FINISH** Wire Cloth, **WICKWIRE** Hex. Netting.

Made from Hard Drawn Steel Wire.

Made from Hard Drawn Bronze Wire.

Made from Hard Drawn Galvanized Steel Wire.

Galvanized Before or After Weaving.

TINNED, BRIGHT BLUED, BRASS, COPPER WIRE CLOTH, FOR SPECIAL PURPOSES.

CORN POPPERS, DISH COVERS, METALLIC AND SQUARE COAL SIEVES, FLOUR SIEVES.

NATIONAL WIRE CORP., NEW HAVEN, CONN.,

Manufacturers of

WIRE, WIRE RODS AND WIRE NAILS

Fence, Market, Galvanized, Screw, Bolt, Telephone and Telegraph

WIRE

Straightened and Cut Wire 1 in. and smaller.

Special Wire For all Purposes.

Eastern Agents, JOHN WALES CO. 141 High St., Boston, Mass.

Send for Prices.

MICHIGAN WIRE CLOTH CO.,

MANUFACTURERS OF WIRE CLOTH OF ALL KINDS

From BRASS, COPPER, STEEL, IRON, GALVANIZED, TINNED and BRONZE WIRE

Including PAINTED, GALVANIZED and BRONZE WINDOW SCREEN CLOTH.

ESTABLISHED 1869.

WRITE FOR CATALOGUE.

500 HOWARD ST., DETROIT, MICH.

GEO. W. PRENTISS & CO., - HOLYOKE, MASS.

MANUFACTURERS OF

Iron and Steel

WIRE

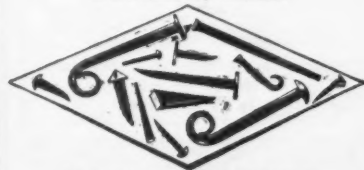
of every description for General and Special Purposes.



DIAMOND TACK

AND NAIL WORKS,

RAYNHAM, MASS.



MANUFACTURERS.

SEND FOR QUOTATIONS.

Hungarian Nails.

Shoe Nails

FOR

LIGHTNING AND McKAY HEELING MACHINES.

Daily Capacity 10,000 lbs.

Export Orders Filled Promptly.



E. Phillips & Sons,

Principal Office and Works,
SOUTH HANOVER, MASS.,
U. S. A.

BOSTON OFFICE, 143 Lincoln St.

Zinc Plates

Cut and shaped to order for Boilers, Batteries, etc.

Zinc Shoe Nails For Export.

Zinc Roofing Nails.

Zinc Sheathing Nails.

30,000 HOLES TAPPED IN 10 HOURS.

THE HUBBELL TAPPING MACHINE

SEND FOR CIRCULAR

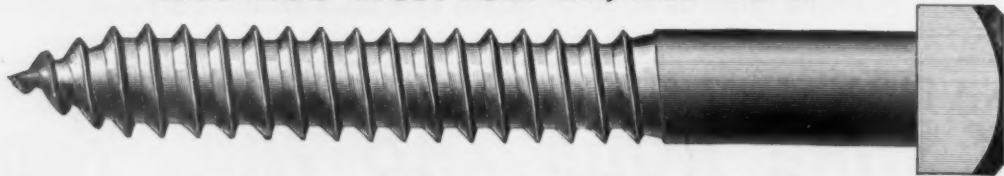
SEMI-AUTOMATIC

HARVEY HUBBELL,

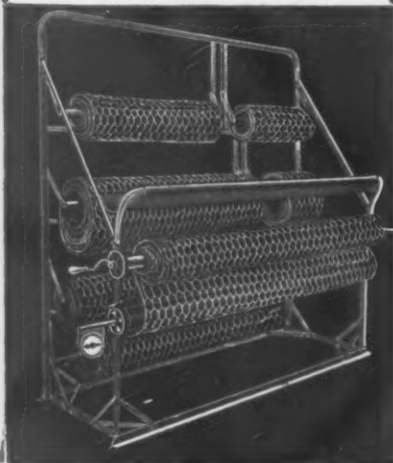
BRIDGEPORT, CONN.

SAM'L HALL'S SONS,

Established 1839,

229-233 West 10th St., New York.

MANUFACTURERS OF SUPERIOR QUALITY

Machine Bolts, Lag Screws, Washers.**BRADDOCK MACHINE & MANUFACTURING CO.**Engineers, Founders and Machinists,
BRADDOCK, PA.*Rod Mill Plants, Wire Mill Plants, Nail Machines,
Barb Wire Machines, Galvanizing Plants.*Wire Drawing Machinery, Flange and Compression Couplings, Hangers and Pillow Blocks, Pulleys
and Shafting, Power Transmission Machinery, Air Compressors.**"TALLY-HO"
Display Rack**AND
MEASURING MACHINE,
arranged for conveniently measuring,
winding and handling
POULTRY NETTING.Patented in U. S. and Canada.
No longer an experiment. Hundreds are
now being successfully used. Sold by all
leading wholesale hardware dealers. Write
for prices and testimonials.**MATTHEW BURTON,**
Manufacturer,
BATAVIA, ILLS.

OHIO.

PENNA.

NEW YORK.

7 Factories.

KEGS.

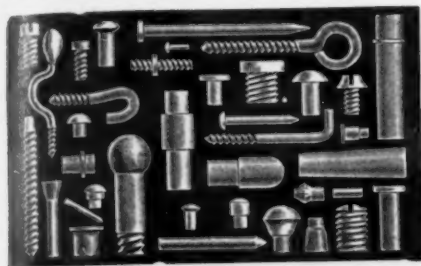
20,000 Daily.

For Nails, Spikes, Bolts, Nuts, Rivets and Horse Shoes.

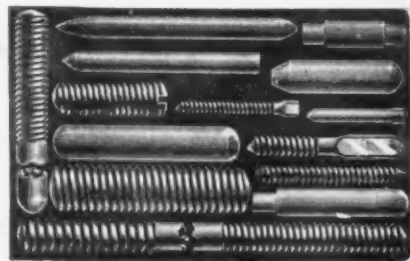
THE EDWIN BELL & SONS CO.,
YOUNGSTOWN, O.

1880.

**The Plymouth Mills,
RIVETS and TACKS,
Plymouth, Mass.**



**Iron and Brass Rivets,
STUDS, PINS,
SCREWS, &c.**
For Manufacturers of Light Hardware.
BLAKE & JOHNSON,
WATERBURY, CONN.



GRAND CROSSING TACK CO., Grand Crossing, Chicago, Ill., U. S. A.



**RIVETS,
STAPLES,
WIRE NAILS,
SHOE NAILS
TACKS.**

BEST STOCK. PERFECT GOODS.

SEND FOR BOOK ON BOLTS TO
THE
Franklin Moore Co.,
Winsted, Conn.
Pacific Coast Office, 105 Front St., San Francisco, Cal.

PITTSBURGH SCREW & BOLT CO.,
PITTSBURGH, PA.

MACHINE BOLTS

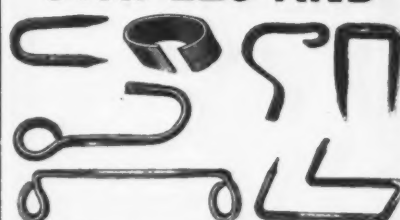
We have a well assorted stock of both
Square and Hexagon heads. Can
fill orders promptly.

SHELTON COMPANY. ESTABLISHED 1836.
**TACKS, SMALL NAILS, Etc.,
CARRIAGE, TIRE and STOVE BOLTS.**
Factories, SHELTON, CONN. NEW YORK OFFICE and WAREROOM, 64 READE ST.

1879 **RIPLEY & BARTLETT,** 1899
TACKS
MFRS. OF **TACKS** INQUIRE FOR PRICES.
PLYMOUTH, MASS., U. S. A.

E. H. TITCHENER & CO.,
BINGHAMTON, N. Y.

STAPLES AND



WIRE SHAPES

Factories, { Binghamton, N. Y.
Chicago, Ill.

Milwaukee Tack Co.,
MILWAUKEE, WIS.

**TACKS,
NAILS,
RIVETS.**

WRITE FOR PRICES.

**WIRE NAIL
MACHINERY.**

Improved Perkins Pattern.
All Sizes—3d. to 20d.

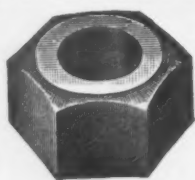
H. J. MILLER, Bridgewater, Mass.

**HIGHEST SPEED
Tack Machines**

Ryan's Patents.

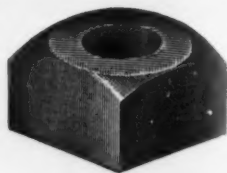
WM. A. SWEETSER, 39 Montello St.,
BROCKTON, MASS.

**R COBB & DREW, T
I V E T S TACKS
Factories:
PLYMOUTH, MASS., and
ROCK FALLS, ILLS.
Iron, Brass and Copper Rivets,
Nails and Double Pointed Tacks.
Staples, Burrs, Washers.**



**The Milton
Manufacturing Co.,**
MILTON, PENNSYLVANIA.

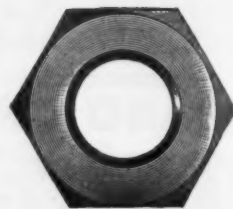
N
U



Cold Punched PLAIN, CHAMFERED, SEMI-FINISHED
AND CASE HARDENED

ALSO, HOT PRESSED

T
S



Wrought and Steel Washers.

Cold Punched Nuts a Specialty.

**THE ELASTIC
SELF-LOCKING
STEEL NUT.**



The only perfect
self-locking nut.
Always grips the
bolt firmly.
Never works loose.
Strongest, best
and cheapest Nut
on the market.

These nuts are made of a flat bar
of Steel, bent around into a ring
and then pressed into the shape of
a Nut, with an opening on the side.
They are threaded slightly smaller
than U. S. Standard, so that when
wrenched on the bolt the split
side is forced open a trifle, thereby
gripping the bolt, which holds
them from ever working loose like
the ordinary Nut. Simple, practical,
applied the same as any nut,
and requires no nut-lock.

In use by largest Railroads, Ma-
chinery Builders, Engineers, etc.
Write for Booklet, prices and
samples to

National Elastic Nut Co.,
MILWAUKEE, WIS.
SOLE MANUFACTURERS

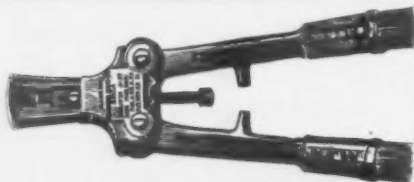


C.C. & E.P. TOWNSEND,

NEW BRIGHTON, PA.

MANUFACTURERS OF

RIVETS, WIRE & WIRE NAILS.



Bolt and Rivet Clippers

For Cutting off the ends of Bolts and Rivets;
Liberal discounts to the trade.

CHAMBERS BROTHERS COMPANY

320 St., Below Lancaster Ave.,
PHILADELPHIA, PA.

ALL GRADES OF FINISHED

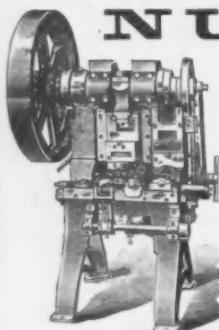
NUTS

AND

AUTOMATIC

COLD PRESS

NUT MACHINES.



Manufactured by
Dunham Nut Co.,
Unionville, Conn.,
U. S. A.

RHODE ISLAND TOOL CO.

PROVIDENCE, R. I.

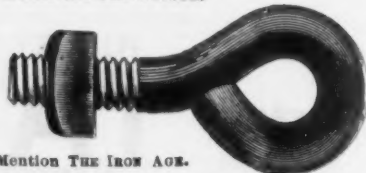
EYE BOLTS:
BLANK.
THREADED.

Rockford Bolt Works,

20 Mill Street, ROCKFORD, ILL.

All kinds of Bolts, Lag Screws,
Rivets, Washers and odd
Bolt Work.

Write for our Prices.



Mention THE IRON AGE.

WM. H. HASKELL, Pres.

JACOB STEPHANS, Gen'l Manager.

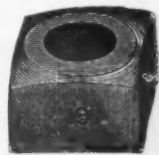
J. MILTON PAYNE, Treas.

WM. H. HASKELL MFG. CO.,

SUCCESSORS TO

WM. H. HASKELL CO., and PAWTUCKET NUT CO.,

MANUFACTURERS OF

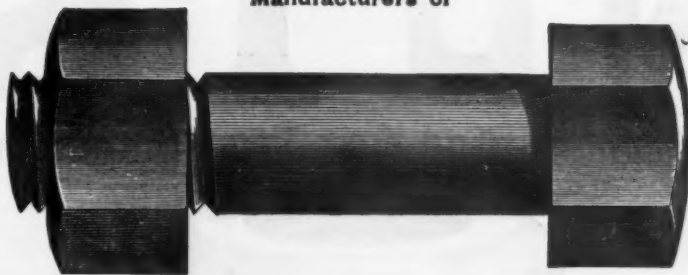
Bolts, Coach Screws, Set Screws,
Cap Screws, Nuts, Washers, Chain
Links, Stirrups, Levers, Clearer
Springs, Etc.

PARTICULAR ATTENTION PAID TO SPECIAL WORK.

Office and Works, 451 Main Street, - PAWTUCKET, R. I., U. S. A.

WORCESTER MACHINE SCREW CO., Worcester, Mass.SET.
CAP AND
MACHINE
SCREWS.

Manufacturers of

STUDS FOR
STEAM
ENGINE,
PUMPS, &c.

WILSON & SMITH, - - Worcester, Mass.

Cold Punched Nuts and



Washers for all Purposes.

Metal Punching and Die Work

SEND US SPECIFICATIONS FOR YOUR

SPECIAL STAMPINGS.**Helwig's Patent Bolt and Rivet Clipper.**

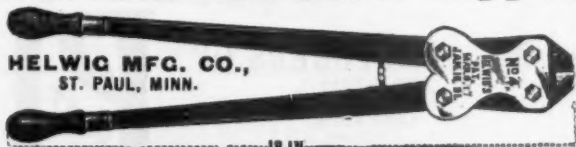
Light, Strong,

Powerful, Durable.

No. 1 cuts $\frac{1}{4}$ or less.
No. 2 cuts $\frac{1}{2}$ or less.
No. 3 cuts $\frac{3}{4}$ or less.
No. 4 cuts 1 or less.

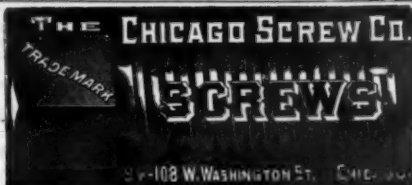
CUTS CLOSE TO WORK.

HIGHEST TESTIMONIALS FROM JOBBERS AND CONSUMERS



SEND FOR CIRCULAR

PHILADELPHIA MACHINE SCREW WORKS, 624-626 Race St., Philadelphia.

Manufacturers of all kinds
of Special Machine Screws
and Studs, Thumb Screws
and Nuts, Bicycle and Elec-
trical Work.SET, CAP and
MACHINE
SCREWS,Filled Coupling
Bolts, etc.Sole Mfrs. of the Genuine
Huntington Emery
Wheel Dresser.
Hexagon Nuts.Finished and
Case Hardened
Bicycle Parts.**EXPANSION BOLTS.**For fastening all kinds of structure to brick
and stone work.STEWART & ROMAINE MFG. CO.
SOLE MANUFACTURERS. PHILADELPHIA.**EXPANSION BOLTS**

For fastening all kinds of structure to brick and stone work

Patentee and Mfr, ISAAC CHURCH,
Send for Catalogue A. Toledo, Ohio.MACHINES FOR MAKING
RIVETS, NUTS,
AND FOR ROLLING
THREADS.

BUILT BY

The WATERBURY FARREL
FOUNDRY & MACHINE CO.
Waterbury, Conn., U. S. A.

WE ARE MANUFACTURERS OF

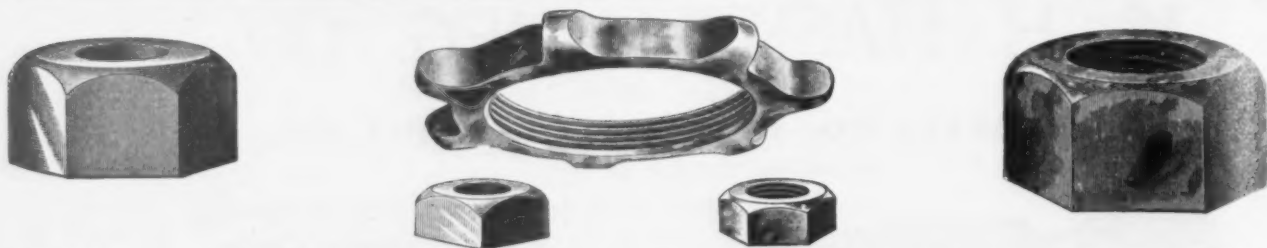
Perkins Wire Nail

AND

**High Speed Tack
Machines.**We make all sizes of Tack Machines, Choppers,
Slitters, Rattlers, Sifters, etc. All styles of Tack
Machine Feeds.

Send for Catalogue and Prices.

HENRY PERKINS, - Bridgewater, Mass.



PORT CHESTER BOLT & NUT CO.,

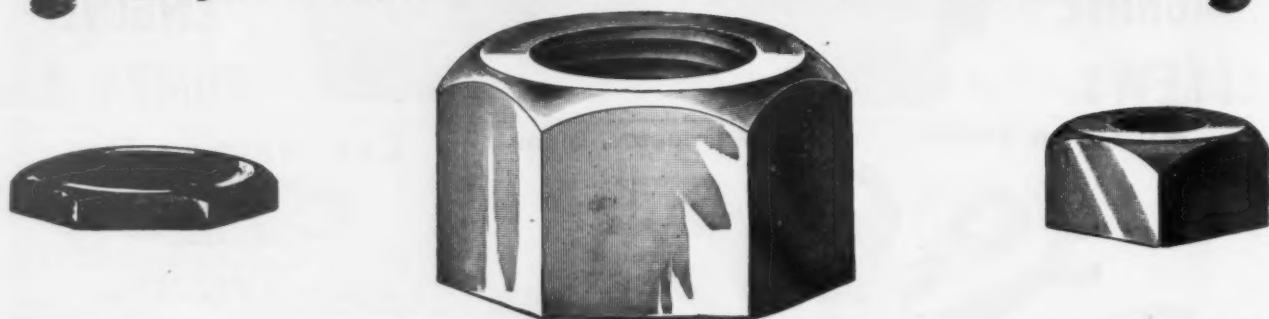
PORT CHESTER, N. Y.,

MANUFACTURERS OF

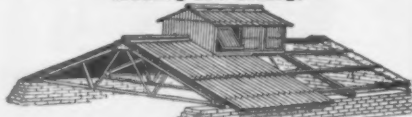
Cold Punched, Chamfered and Trimmed, Case Hardened and Semi-Finished

NUTS.

Bicycle Supplies, &c., &c. Tire Bolts a Specialty.

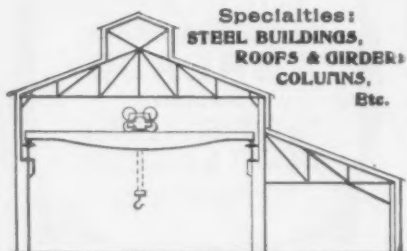


Corrugated, and all Other Shapes of Iron
Roofing and Siding.



Iron Buildings, Roofs, Doors, Shutters, Cornices,
Skylights, Bridges, &c.

Moseley Iron Bridge and Roof Co.
Office, 20 Cortlandt St., Room 128, NEW YORK.



Specialties:
STEEL BUILDINGS,
ROOFS & GIRDERS
COLUMNS,
Etc.

SHIFFLER BRIDGE CO.,
PITTSBURGH, PA.

Branch
Offices: } NEW YORK, 45 Broadway.
PHILADELPHIA, 1214 Beta Building.
CHICAGO, 1243 Marquette Building.
MINNEAPOLIS, 228 Lumber Exchange

STEEL FRAME MILL BUILDINGS,

Tanks for Water, Gas or Oil,
Sheet and Plate Iron Work,
Corrugated Iron,
Water Filters, 10 to 10,000 gal. capacity

WM. B. SCAIFE & SONS, - Pittsburgh, Pa.



OUR TRADE MARK PROTECTS YOU.

The Kidd Bros. & Burgher Steel Wire Company,

McKEE'S ROCKS, PA.

Sole Manufacturers of KIDD SPECIAL DRILL RODS, NEEDLE
WIRE AND HIGH GRADE STEEL WIRES.

READING FOUNDRY COMPANY, Limited,
READING, PENNA.,

MANUFACTURERS OF

FIRE HYDRANTS,
STOP VALVES,
LAMP POSTS,
TURBINES,
LOAM WORK, &c., &c.
GEN. FOUNDRY and MACHINE WORK.

CAST IRON PIPE

for Water and Gas, Sewers, Culverts and Drains,
Bell and Spigot or Flanged, with Fittings.

United States Cast Iron Pipe and Foundry Co.,
Manufacturers of

CAST IRON PIPE.

Eastern Office, Land Title Bldg., Broad and Chestnut Sts., Philadelphia, Penna.
Cable Address, McNealpipe, Phila.

N. LILIENBERG

150 BROADWAY, N. Y.

SWEDISH IRON & STEEL

All grades from the famous
DAWENMORE WORKS, ÖSTERBY, LÖNNESUND,
SÖDERFORS and others.

HAVE YOU

Seen our Triangle Feed for Tack Machines?

IT IS A WONDER!!

Guaranteed Increase 25% in Speed

KIMBALL BROS. & SPRAGUE.

BROOKTON, MASS.

BOSTON BRIDGE WORKS,

BOSTON, MASS.,

ENGINEERS AND CONTRACTORS

FOR ALL KINDS OF

STRUCTURAL WORK,

Steel Buildings, Roof Trusses, Bridges, Etc., Large or Small.

SEND FOR ESTIMATE.

THOS. B. RITER, Pres.

WM. C. COFFIN, Vice-Pres.

JOHN S. CRAIG, Sec'y and Treas.

ROBERT A. MCKEAN, Gen. Mgr.

STEEL CONSTRUCTION

IN ALL BRANCHES.

BUILDINGS DESIGNED AND ERECTED IN ALL PARTS OF THE WORLD.

Roof Frames, Trusses and Girders, Blast Furnaces and Steel Works, Cupolas, Ladles,
Converters, Boilers, Tanks and Heavy Plate Work, Gas Holders, Purifiers, etc.,
Open Hearth Furnace Casings, Chimneys, Riveted Pipe, Corrugated Iron.

RITER-CONLEY MFG. COMPANY, Pittsburgh, Pa., U. S. A.

NEW YORK OFFICE: 39-41 CORTLANDT STREET.

STEEL BUILDINGS

New England Structural Co.,

AND

BRIDGES.

Ornamental Iron Work,
Bronze Work.

WORKS:
EVERETT, MASS.

THE "EASY" BOLT CLIPPER.

WILL CUT ANYTHING.



Manufactured by
H. K. PORTER
6 Ashland St.
Everett, Mass.

Over 69,000 Sold.

It is the BEST in the World.

For sale by the trade generally. SEND FOR CIRCULAR.
Sells, Sennenthal & Co., London, Eng., Agents for Great Britain and Ireland.

WILLSON ALUMINUM CO.,

Manufacturers of **FERRO-CHROMIUM,**

Office, 99 CEDAR STREET, NEW YORK.

WORKS: Holcomb Rock, Va.; Kanawha Falls, W. Va.

NAME PLATES

Made of BRONZE, ALUMINUM or IRON,
in all styles of finish

FOR MACHINERY.

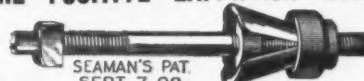
We **MAKE** and **FINISH** our own Castings.

Send in samples for prices, stating quantity required. We can furnish designs.

HOMER F. LIVERMORE, 85 Pearl Street, BOSTON.



THE POSITIVE EXPANSION BOLT.



SEAMAN'S PAT.
SEPT. 7, 98

"CAN'T SLIP."

Mfd. by DANIEL O. SEAMAN & CO.,
1638 Hutchinson St., Phila., Pa. Write for prices.
For sale by NEAL & BRINKER, 18 Warren St., New York

NATIONAL TUBE COMPANY

MANUFACTURERS OF

BLACK AND GALVANIZED

Wrought Merchant Pipe

ALL KINDS, SIZES 1-8 TO 30 INCHES.

BOILER TUBES.

Mild Steel and Charcoal Iron for Stationary, Locomotive and Marine Work.

CASING, TUBING AND DRIVE PIPE FOR WELL PURPOSES.

GAS AND OIL LINE PIPE.

Cylinders Lapwelded and Seamless, tested 100 lbs. to 3,700 lbs., for Compressed Air, Carbonic Acid Gas, Anhydrous Ammonia, Etc., Etc., Etc.

Water and Gas Mains.

CONVERSE AND MATHESON, LEAD JOINT, PIPE FOR MAINS.

SEAMLESS TUBES, SHRAPNEL, PROJECTILES AND MISCELLANEOUS FORGINGS.

OFFICE OF
PRESIDENT AND TREASURER,
Havemeyer Bldg., New York.

OFFICE OF
MERCANTILE AND MANUFACTURING DEPTS,
Conestoga Bldg., Pittsburgh, Pa.

— LOCAL SALES OFFICES —

Havemeyer Building, New York.

70 Federal Street, Boston.

267 So. 4th Street, Philadelphia.

Conestoga Building, Pittsburgh.

Western Union Building, Chicago.

— FOREIGN OFFICE —

Dock House, Billiter Street, London, E. C., Eng.

TELEGRAPHIC ADDRESS, - - TUBULIFORM, LONDON.

American Steel Hoop Company

GENERAL OFFICES, PITTSBURG

MANUFACTURERS

BAR IRON

Common, Refined and "BB" Iron.

Flats, Rounds, Squares, Ovals, &c.
Chain and Rivet Iron,
Bolt and Nut Iron.

"STAR" and "EAGLE" Horse Shoe Iron.
Skelp Iron, &c.

BAR STEEL

Bessemer and Open Hearth.

Flats, Rounds, Squares, Ovals,
Angles, Channels, Special Shapes.
Round Edge Steel Tire.
Agricultural Shapes, &c.

BANDS and HOOPS

Bessemer and Open Hearth.

All widths and gauges.
Steel Skelp, Hame Back,
Tongue Cap, Cotton Ties, &c.

DISTRICT SALES OFFICES

New York

Battery Park Building

Chicago

Marquette Building

St. Paul

Endicott Building

Boston

No. 8 Oliver Street

St. Louis

Fullerton Building

San Francisco

No. 23 Davis Street

New Orleans

Hennen Building

Montreal

Temple Building

American Sheet Steel Company

Manufacturers of

Black and Galvanized Sheets

Battery Park Building

New York

American Tin Plate Company

MANUFACTURERS.....

Tin Plate



Terne Plate



.. and ..

Black Plate

GENERAL OFFICES:

Battery Park Building, NEW YORK CITY.

Tennessee Coal, Iron & Railroad Company,

General Offices, BIRMINGHAM, ALABAMA.

MAKERS

Basic Open Hearth Steel.

Blooms, Billets and Slabs.

Foundry, Forge and Basic Pig Iron.

Merchant Bar-Iron and Steel.

Steel Castings.

MINERS AND SHIPPERS

Coal, Coke, Ore, Limestone and Dolomite.

Export Facilities through Ports of New Orleans, Mobile, Pensacola, Charleston, Port Royal, Brunswick, Savannah and Norfolk.

Sloss Sheffield Steel and Iron Company, Sloss Iron and Steel Company,

BIRMINGHAM, ALABAMA.

Manufacturing following well known brands of foundry iron:

"Sloss," "Florence," "Sheffield," "Lady Ensley."

Selling Agents:

Hugh W. Adams & Company, 15 Beekman Street, New York City.
Hugh W. Adams & Company, 85 Water Street, Boston, Mass.
D. L. Cobb, 1439 Monadnock, Chicago, Ill.
D. L. Cobb, 305 Security Bldg., St. Louis, Mo.
J. K. Dimmick & Company, 911 Drexel Bldg., Philadelphia, Pa.
Stevenson, Field & Company, 45 Board of Trade, Columbus, Ohio.
C. L. Baum, Salt Lake City, Utah.
J. R. Lehmer, 1213 Farnam Street, Omaha, Neb.
Martin Pipe & Foundry Company, San Francisco, Calif.
Hasam & Moreno, la Calle de las Damas 5, City of Mexico.

SHIPPERS OF

FOUNDRY COKE FROM WASHED COAL,

CELEBRATED

SLOSS PRATT STEAM AND

BLOCK DOMESTIC COAL.



HIGH GRADE POLISHED SHAFTING
AND SPECIAL SHAPES.

YOUNGSTOWN, O.

CONSOLIDATED IRON & STEEL CO.,

MANUFACTURERS OF

Refined Bars, Rods, Band and Hoop Iron.

Rolling Mill at BRISTOL, PA.

Office—664 BULLITT BUILDING, PHILADELPHIA.

High Carbon Open Hearth Hammered Billets, Blooms, Etc.

3-in. and larger, for special purposes.

Write for prices, giving specification and purpose.

ALQUIPPA STEEL CO.,

512-513 Times Building, Pittsburgh, Pa.

WILLIAM H. WALLACE & CO.

IRON AND STEEL.

66 Broadway, - New York.

PIERSON & CO.,
29 Broadway, New York, N. Y.

GALVANIZED SHEETS

Correspondence Solicited.

THE ...

COSHOCTON
ROLLING
MILL CO.,

MANUFACTURERS

COMMON AND
SMOOTH
FINISH STEEL
SHEETS.

OFFICE AND WORKS,
COSHOCTON,
OHIO.

TIDEWATER STEEL CO.

MANUFACTURERS OF

FOUNDRY, FORGE AND BASIC PIG IRON.

BASIC OPEN HEARTH STEEL INGOTS, BILLETS, SLABS

and Highest Grades of

FIRE BOX, BOILER, SHIP AND TANK PLATE

PROMPT SHIPMENT.

Works on the Delaware, CHESTER, PA.

PHILADELPHIA OFFICE, - - - LAND TITLE BUILDING.

Foreign Correspondence Solicited.

Cable Address, TIDE STEEL, PHILADELPHIA.

BEAMS

I Beams, all sizes, 3 in to 24 in.	} IN STOCK.
Channels, " 2 in. to 15 in.	
Angles, " 2 in. to 6 in.	
Zee Bars, " 3 in. to 6 in.	

CUT TO LENGTH, PUNCHED AND FITTED.

W. W. LINDSAY & CO., HARRISON BUILDING,
PHILADELPHIA.

WIRE RODS

ASHLAND STEEL COMPANY, Ashland, Kentucky.

MANUFACTURERS

Bessemer Pig Iron, Bessemer Steel Billets, Slabs and
WIRE RODS.

WIRE RODS

Bessemer and Open Hearth Steel.

GRAND CROSSING TACK CO.,

GRAND CROSSING, CHICAGO, ILLS., U. S. A.

ALSO MANUFACTURERS OF RIVETS, STAPLES, STANDARD AND MISCELLANEOUS WIRE NAILS, TACKS AND SHOE NAILS.

VIRGINIA IRON, COAL AND COKE CO.,

Miners, Manufacturers and Shippers of

Pig Iron, Open Hearth Basic Steel,

PIG IRON BRANDS:

Dora,
Watts,
Crozer,
Bristol,
Graham,
Radford,
Max Meadows,
Buena Vista—Basic,
Embreville—Malleable,
Carnegie—Bessemer and
Low Phos.
Reed Island—Cold Blast
Charcoal.

Foundry
and
Forge.

**Horse Shoes,
Merchant Bar Iron,
Cast Iron Pipe,
Coal and Coke.**

GENERAL OFFICES:

BRISTOL, VA.-TENN.

TOMS CREEK:

Steam and Domestic Coal,
Foundry and Furnace
Coke.

RADFORD
PIPE WORKS:
Cast Iron Pipe.

CABLE ADDRESS:

IRONVIRGIN—BRISTOL.

STATLER-BISCHOFF CO.

TUBING
STRUCTURAL MINING ALL SHAPES ALL KINDS WRITE

ROCKWELL & FILLMORE STS. CHICAGO, ILL.

Pennsylvania Smelting Company,

Buyers of all kinds of Residues or Drosses containing Lead, Zinc,
Tin and Antimony.

829 Carnegie Bldg., Pittsburgh, Pa.

Works at Carnegie, Pa.

REED F. BLAIR & CO.
LEWIS BUILDING, PITTSBURG, PA.

Ores, Coke, Pig Iron,
Ingot Moulds,

Ferro-Manganese, Etc.
Brier Hill Portland Cement.
CRUSHED LIMESTONE.

SEAMLESS STEEL TUBING.

(OPEN HEARTH-BASIC PROCESS.)

Hollow and Solid Billets to Specifications and Analysis.

Solid Billets, Square and Round.

Ingots, Square and Round.

Seamless Tubes for Pneumatic, Hydraulic and High Pressure Boiler Tubes,
Automobiles, Hollow Spindles, Hollow Axles, etc.

HECKERT-BALTZLEY BILLET CO.,

General Office,
St. Clair Bldg.,

TOLEDO, OHIO.

THOMAS W. FITCH, Pres.

THOMAS W. FITCH, Jr., Sec'y and Treas.

PITTSBURGH STEEL SHAFTING COMPANY,

Offices: 1212-1214 Park Building, - - PITTSBURGH, PA.

Turned, Rolled and Polished

STEEL SHAFTING

AND SQUARE AND HEXAGON BARS.

Eastern Office, POSTAL TELEGRAPH BUILDING, 253 Broadway, NEW YORK.

CHAMPION IRON & STEEL COMPANY,

MUSKEGON, MICHIGAN.

—MANUFACTURERS OF—

**OPEN HEARTH INGOTS, BILLETS AND BARS,
MERCHANT BAR IRON AND BAR STEEL.**

Also Buyers of Wrought Iron and Steel Scrap.

SOLICIT CORRESPONDENCE.

American Iron and Steel Manufacturing Co.,

Lebanon, Pennsylvania.

Proprietors and Operators of the Plants formerly owned by Pennsylvania
Bolt and Nut Co., J. H. Sternbergh & Son, National Bolt, Nut and
Rivet Works, Lebanon Iron Co., and East Lebanon Iron Co.

MANUFACTURERS OF

MERCHANT BAR IRON

MACHINE AND CARRIAGE BOLTS,

COLD PUNCHED NUTS,

HOT PRESSED NUTS,

TRACK BOLTS, SPIKES, RIVETS, &c., &c.

CAR FORGINGS, BRAKE LEVERS.

Link Pins, Tie Rods for Cable and Electric Roads, Galvanized Cross Arm Braces, Brace Bolts, Cross Arm
Bolts, Pole Steps, &c., for Telegraph and Telephone Line Construction.

A COMPLETE LINE CARRIED IN STOCK AT WORKS.

CORRESPONDENCE SOLICITED.

Established 1810.

Incorporated 1890.

LUKENS IRON AND STEEL CO.

A. F. HUSTON, President.

CHAS. L. HUSTON, Vice-President.

JOS. HUMPTON, Secretary and Treasurer.

UNIVERSAL MILL PLATES. STEEL PLATES ALL GRADES.

To extreme dimensions, width up to 10 feet.
Thickness, No. 10 gauge to 2 inches.

The first to make BOILER PLATES in America.

MAIN OFFICE AND WORKS:

Coatesville, Pa.
BOSTON OFFICE:
8 Oliver St.

NEW YORK OFFICE:

No. 29 Broadway.
BALTIMORE OFFICE:
102 South St.

NEW ORLEANS OFFICE AND WAREHOUSE:

626-630 South Peters St.
CHICAGO OFFICE: A. M. CASTLE, Sales Agent,
54 South Canal St.

PHILADELPHIA OFFICE:

Fidelity Building, Rooms 405-6-7,
N. Broad St. above Arch St.

FRANK SAMUEL,
Harrison Building,
15th & Market Sts.,
Philadelphia.

LOW PHOSPHORUS

PIG IRON—.08 or under.
SCRAP—.08 or .05 or under.
ORE—For O. H. and Furnace Use.
MELTING BAR—
Open Hearth and Bessemer Billets.
Skelp, Muck Bars and Scrap, Foundry and Bessemer Pig Iron.
Syracuse Tube Co.'s Tubes and Pipe.

THE PHOENIX IRON CO.,
410 WALNUT ST., PHILADELPHIA,

MANUFACTURE
ALL THEIR
PRODUCTS
BOTH IN

WROUGHT IRON AND
OPEN HEARTH STEEL.

Beams, Channels, Deck Beams, Angles, Tee-bars, Zee-bars and other shapes, Round Flat and Square BARS of all sizes, especially adapted for Bridge and Ship Builders, Fire-proof Buildings, Shafting and all Structural Purposes.
SPECIALTIES, in Wrought Iron or Steel:—Phoenix Columns and Upset Eye-bars of all sizes, Roof Trusses, Girders, Joints and Built-up Shapes of every description.

AGENTS: THE PHOENIX IRON CO., 49 William St., NEW YORK; J. B. STOKES, 132 Market St., SAN FRANCISCO. WESTERN OFFICE: A. C. STITES, 981 The Rookery, CHICAGO.

Established 1845.

PINE IRON WORKS CO.

Incorporated 1899.

JOSEPH L. BAILEY, President.

MANUFACTURERS OF

JOSEPH BAILEY, Treasurer.

STEEL PLATES, Ship, Tank, Boiler.

IRON PLATES, Skelp, Tank, Boiler.

CHARCOAL PLATES FROM
HAMMERED CHARCOAL BLOOMS. PINE IRON WORKS, BERKS CO., PENNA.

TESTED CHAINS.
BRADLEE & CO., EMPIRE CHAIN WORKS,
BEACH ST. AND EAST SUSQUEHANNA AVE., PHILADELPHIA.

CHAINS FOR FOUNDRY CRANES AND SLINGS.

"D. B. G." SPECIAL CRANE CHAIN.

STEEL AND IRON DREDGING, SLOPE AND MINING CHAINS.
SHIP'S CABLES AND MARINE RAILWAY CHAINS.

NATIONAL STEEL COMPANY,

BATTERY PARK BUILDING, NEW YORK.

Manufacturers of

BESSEMER AND OPEN HEARTH BILLETS
SHEET AND TIN PLATE BARS

Passaic Rolling Mill Co., Paterson, N. J.
ROLLED STEEL BEAMS,

Channels, Angles, Tees, &c. Riveted Work, Forgings, Eye Bars, &c.
HIGH GRADE MERCHANT BAR IRON.

NEW YORK OFFICE, ROOMS 151 AND 152, No. 45 BROADWAY
BOSTON OFFICE, No. 31 STATE ST.

THE ARTHUR C. HARVEY CO.
BOSTON, MASS.

Importers and Dealers.

Norway and Swedish
IRON.

Full assortment of Iron and Steel in Boston
Warehouse.

HOBSON, HOUGHTON & CO.

Successors to FRANCIS HOBSON & SON, DON STEEL WORKS, SHEFFIELD.

Sole Manufacturers of

Hobson's "Choice"  Extra Best Tool Steels, "Warranted Best" Cast Steels for Tools, etc.

HOBSON'S "CHOICE" Extra Quality Needle Wire.

"SOHO" Special Self Hardening Steel.

Bright Drill Rods, Highest Quality and Accuracy.

WAREHOUSE, 98 John St., New York.

CHAS. HUGILL, Agent.

S. & C. WARDLOW, SHEFFIELD, ENGLAND.

Manufacturers of the Celebrated Cast and Double Shear Steel,

in Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Razors, Carvers, Butchers' Knives, Files, Band Saws, Clock, Watch and all other Springs; also Sole Makers of the Special Brand **"TOUGH"** Cast Steel for Leather Splitting and Machine Knives of every description and for Turning and

Office and Warehouse, 95 John St., New York.

Frank S. Pilditch, Agent.

JONAS & COLVER CONTINENTAL STEEL WORKS, SHEFFIELD, ENGLAND.

MANUFACTURERS OF ALL KINDS OF STEEL.

Tool Steel, Drill Rods, Needle Wire, Hot Rolled Sheet Steel, Cold Rolled Steel for Corset Springs, Band Saws, Clock and Watch Springs and Parts, and all other purposes.

HERMANN BOKER & CO., 101 & 103 Duane Street,

Formerly CARL F. BOKER,

Sole Agents and Importers of Steel and Crucible Wire Rods, &c.

JESSOP'S STEEL

of BEST QUALITY,

in BARS, SHEETS and PLATES.

Large assortment of sizes in stock at

91 JOHN ST., - - - NEW YORK.

And other Agencies

Established 1774

MANUFACTURED BY

WM. JESSOP & SONS, L'D.

SHEFFIELD,
ENGLAND.

Highest Award and
Medal World's Fair, 1898.

CHAMPION TOOL STEEL.

Extra, Special and Double Special

Highest Quality Drill Steel,

MFD. BY

THE BENJ. ATHA & ILLINGWORTH
COMPANY.

ATHA AIR HARDENING TOOL STEEL.

C. S. & O. H. DIE BLOCKS.

NICKEL STEEL.

FORGINGS AND CASTINGS.

All kinds of lower grade Steels.

DENMAN & DAVIS, Agts.

Office and Warehouse, 85 and 87 JOHN STREET, N. Y.

MANUFACTURERS OF

Open Hearth Steel
Structural Shapes,
Bars, Shafting,
Car and Engine Axles.

Pencoyd Iron Works.

PERCIVAL ROBERTS, JR., Pres. J. W. DAVIS, Sec. and Treas.
P. W. ROBERTS, Vice-Pres.

A. & P. Roberts Company.

OFFICES:

PHILADELPHIA, 261 So. 4th St.
NEW YORK, 100 Broadway.
BOSTON, 27 State St.
CHICAGO, The Rookery.

CLEVELAND, Perry-Payne Bldg.
ST. LOUIS, Security Bldg.
BALTIMORE, Equitable Bldg.
NEW ORLEANS, 63 So. Peter St.
MONTREAL, 35 St. Francois Xavier St.

DESIGNERS AND BUILDERS OF

Train Sheds, Viaducts

BRIDGES,

Elevated Railroads

and all Steel Structures.

WHELOCK, LOVEJOY & CO.,

23 CHIN ST., NEW YORK.

35 Oliver St., BOSTON.

FIRTHS STEEL

AGENCIES:

FIRTH-STERLING STEEL CO.,
Tool Steel.

THOS. FIRTH & SONS, Ltd.,
Tool and Sheet Steel.

GLOBE WIRE CO., Ltd.,
Drill Rods.

SWEDISH IRON AND STEEL.

STAYBOLT, BOILER BRACE, RIVET, TOOL AND AXLE IRON.

VULCAN

HIGH GRADE

IRON

LOCKHART IRON & STEEL CO
PITTSBURGH, PA

SQUARE ROOT AND FILLET ANGLES,
HEXAGONS AND SMALL CHANNELS.

LOCKHART

SOFT

STEEL

W. P. SNYDER & CO.,
Bessemer and Open-Hearth Steel,

BESSEMER PIG, BILLETS, AND SHEET BARS.

Offices, German National Bank Building,

PITTSBURGH, PA.

ESTABLISHED 1848.

SINGER, NIMICK & CO.,

(INCORPORATED.)

—MANUFACTURERS OF ALL KINDS OF—

PITTSBURGH, PA.

Hammered and Rolled

STEEL.

Cold Rolled Strip Steel.

Cold Drawn Bar Steel.

Crucible Tool, Saw, File and Sheet Cast Steel.

Crucible and Open Hearth Agricultural Steel. Rolling Plow Colters. Harrow Discs.

Also Carriage and Wagon Springs and Axles.

SINGER, NIMICK & CO., Incpd., 98, 100, 102 & 104 West Washington St., Chicago, Ill.

Represented at 243 Pearl and 18 Cliff Streets, New York, by

HOGAN & SON, General Agents for Eastern and New England States.

GEORGE M. HOGAN, 417 Commerce St., Philadelphia; FITZ, DANA & CO., 110 North St., Boston.

LA BELLE STEEL CO.,

Ridge Avenue and Belmont Street, Allegheny City, Pa. Post Office Address, Pittsburgh, Pa.

MANUFACTURERS OF ALL KINDS OF **STEEL** SPRINGS, AXLES, RAKE TEETH, Etc.

WETHERELL BROS. Eastern Representatives, 31 Oliver St., Boston, Mass., and 120 Liberty St., New York City.

Chicago Agent, BYRON W. WHITE, 68-70 South Canal St., Chicago.

Canadian Agent, W. C. BLYTH, No. 76 York St., Toronto, Ont.

MONONGAHELA IRON & STEEL CO.,

—MANUFACTURERS OF—

CHARCOAL BAR IRON **CARTER BRANDS** CHARCOAL IRON CHAINS
ALL SIZES.

UNITED STATES GOVERNMENT SPECIFICATIONS GUARANTEED.

PITTSBURGH, PA.

THE LORAIN STEEL CO.Rails & Billets. **LORAIN. O.****SHEAR KNIVES**

SAMUEL TRETHEWEY & CO. LTD.

PITTSBURGH, PA.

ESTABLISHED 1883

DANVILLE BESSEMER COMPANY,

Danville, Penna.

PIG IRON. BILLETS.
PLATES AND ANGLES.**CRESCENT STEEL.**

NEW-YORK • CHICAGO • DENVER •

GAS STOVES, AIR TIGHT STOVES**CYLINDER STOVES, RADIATORS****RANGES****STOVE PIPE AND ELBOWS**

Are a few of the more important articles constructed of

Wood's Patent Planished

...and...

Wood's Smooth Black Sheets**W. DEWEES WOOD COMPANY,**McKeesport, Pennsylvania,
Pittsburgh, U. S. A.**AMERICAN****PIG IRON STORAGE WARRANT CO.,**(Bank of America Building,) 44 Wall St., N. Y.
Correspondence of Furnaces Invited.

ESTABLISHED 1869.
JEROME KEELEY & CO.
 The Philadelphia Bank Bldg., 421 Chestnut St.,
 PHILADELPHIA.

Foundry & Forge Pig Irons
Iron Ores, Coke, Coal.

Steel Blooms, Billets, Rails, etc
Muck Bars, Blooms, Scrap Iron.
 Consulting Engineers in Metallurgy and Mining.

J. Wesley Pullman
 PHILADELPHIA.

BEST AMERICAN AND FOREIGN
IRON ORES.

FRANCIS WISTER,
 COMMISSION MERCHANT,
Coke, Coal, Ores.

Agent for THE BLAIN RUN COAL CO.
 Blain Run Coal is especially adapted
 for Rolling Mill Use.
 Rothschild Bldg., 14 So. Broad St., PHILADELPHIA.
 O. B. Houston. J. Max Bernard. H. H. Houston.

C. B. HOUSTON & CO.,
 Girard Building, PHILADELPHIA

Pig Iron, Coal, Coke, Steel Rails, Structural
Iron, Steel Castings and Fire Brick
 Sole Agents for Paxton Rolling Mills
STEEL AND IRON PLATES.

J. J. MOHR.
 Bullitt Building, No. 131 South Fourth St.
 PHILADELPHIA, PA.

Foundry, Forge, Charcoal and Bessemer Pig Iron.
 Dealer in Scrap, Old Car Wheels, Muck
 Bars and Connellsville Coke.

ERNEST LAW & CO.,
 (Successors to J. W. HOFFMAN & CO.)
 Harrison Bldg., 15th and Market Sts., PHILADA.
Iron and Steel, Coal and Coke,
PIG IRON AND ORES.
 Iron and Steel Plates, Sheets, Bars and Shapes.
 Rails. Cars and Locomotives.
 Track Equipment.
 CORRESPONDENCE SOLICITED.

Justice Cox, Jr., & Co., Ltd.
 552 & 554 Bullitt Building, - Phila., Pa
IRON and STEEL.

—AGENTS FOR—
 Canonsburg Iron & Steel Co.'s
 Lebanon Rolling Mills Co.'s Superior Light Steel Sheets
 Brier Hill Iron & Coal Co.'s Plates and Bars
 Bessemer and Low Phos. Pig Iron
 Pulaski Iron Co.'s
 High Grade Foundry and Forge Pig Iron
 Lebanon Valley Furnace Co.'s
 Corowall Bessemer Pig Iron
 National Structural Tubing Co.'s
 Tubing and Shapes
 Bars, Angles, Sheets, Tank and Bridge
 Plates, Muck Bars, Scrap Iron and
 Steel, New and Old Rails,
 Foreign and Domestic Ores.

W. H. THOMSON & CO.
 DEALERS IN
IRON AND STEEL. COAL AND COKE
STEAMSHIP OUTFITS.
RAILWAY EQUIPMENT
 Room 511-512 Land Title Bldg.,
 Broad and Chestnut Sts.,
 PHILADELPHIA, PA
 Eastern Agents, Youngstown Iron and Steel Roofing
 Co., Youngstown, O.

J. Tatnall Lea & Co.,
 STEPHEN GIRARD BUILDING,
 NO. 19 SO. 12TH ST., PHILADELPHIA,
Bessemer, Mill and Foundry
Pig Iron, Steel Bil-
lets, Muck Bars and
Iron Ores.

Business
 Established, 1826. **ALAN WOOD COMPANY,** Incorporated
 1885.
Manufacturers of Sheets and Light Plates of Iron and Steel,
BLACK AND GALVANIZED.

General Office and Warehouse,
 519 Arch Street, Phila. Schuylkill Iron Works,
 Coateshocken, Penna.
SPECIALTIES.—Patent Planished Locomotive Jacket, Corrugated, Bath Boiler, Gas
 Holder, Swede and Norway Sheets, Blue Annealed, Best Bloom, M. F., A. W. Clean, Cold Rolled
 Sheets, Pickled and Cold Rolled Sheets, Best Last, Water Pipe and Light Plates, Electrical Iron
 and Steel
 The only manufacturers of Sheets having a warehouse in Philadelphia, where we invite the trade and
 consumers to inspect our large and well-assorted stock. Bourse Exhibit, Section "G," 34 to 38.

A. MILNE & CO.,
SWEDISH (NORWAY) IRON AND STEEL.
 Blooms, Billets, Bars; Wire, Rivet and Nail Rods.
FOREIGN and DOMESTIC IRON and STEEL.
 1 Broadway, New York. 8 Oliver Street, Boston.

HORACE T. POTTS & CO.,
 —IMPORTERS OF—
NORWAY (SWEDISH) IRON.
 ALL REGULAR SIZES IN STOCK.
 Special sizes ROLLED or HAMMERED to order
AMERICAN IRON and STEEL of ALL DESCRIPTIONS IN STOCK.
 316, 318, 320 North Third Street, - Philadelphia, Pa.

L. & R. WISTER & CO.,
 672 BULLITT BUILDING, PHILADELPHIA, PA.
 —SALES AGENTS FOR—
AMERICAN SHEET IRON CO.
 Manufacturers of **BLACK SHEET IRON** in gauge from 17 to 28.
WORKS AT PHILLIPSBURG, N. J. CORRESPONDENCE SOLICITED.

JOHN B. NEWKIRK & CO.,
 HAVEMEYER BUILDING, HARRISON BUILDING,
 26 Cortlandt St., 15th and Market Sts.,
 New York. Philadelphia.
STEEL, IRON and COAL.
Railway and Mine Supplies.
LIGHT STEEL RAILS, 16 to 40
lb.

MARINE CHAIN.
JAMES McKAY & CO., - - - Pittsburgh, Pa.
 Canadian Representative:
 HUGH RUSSEL, 185 St. James Street, Montreal, Canada.
 Manufacturers of Stud and Marine Chain of all kinds. All Chain made to the U. S. Admiralty
 Standard. Certificates of tests furnished with shipment. Write for prices.

AM. BICYCLE CO., STEEL FACTORY
 formerly operated by the HART & COOLEY MFG. CO.
COLD ROLLED STRIP STEEL.
George Nash & Co., SO. CHICAGO, ILL.
 General Sales Agents, 24 So. Clinton St., Chicago; 15 Platt St., New York.

GEO. NASH & CO.,
SPECIALTIES IN HIGH GRADE STEEL.
 DRILL RODS. COLD ROLLED STEEL HARDENED AND TEMPERED
 MUSIC WIRE, TO TEMPER FOR STEEL STRIPS AND
 SPRING WIRE, SAWS, SPRINGS, ETC. WIRE, ETC., ETC.
"DANNEMORA" TOOL AND SELF-HARDENING STEEL.
 Manufactured by SEEBORN & DIECKSTAHL, Sheffield, Eng.
 New York, 15 Platt St. Chicago, 24 So. Clinton St.

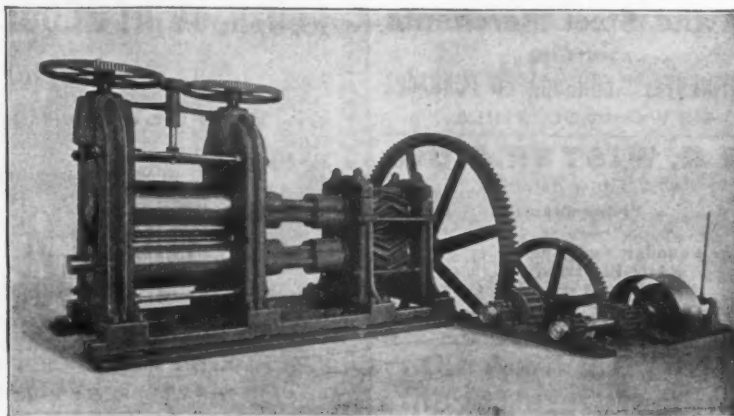
- R. MUSHET'S -
"SPECIAL," "TITANIC,"
 FOR
 LATHE AND PLANER TOOLS. STEEL For Chisels, Taps, Dies, Chilled Roll
 Turning, Punches, &c., &c.
 (The "Trade-Marks" of which are registered in the United States.)
 MANUFACTURED ONLY BY
SAMUEL OSBORN & CO., - - - Clyde Steel and Iron Works, Sheffield, Eng.
 SOLE REPRESENTATIVES IN THE UNITED STATES,
B. M. JONES & CO., - - - No. 81 Milk St., Boston.
 NO. 143 LIBERTY STREET, NEW YORK.

FARREL FOUNDRY & MACHINE CO.,**ANSONIA, CONN.**

BUILDERS OF

Heavy Machinery.

MAKERS OF

Heavy Castings,of IRON, or SEMI-STEEL
in Dry Sand, Green Sand
or Loam.Please specify your inquiry and men-
tion THE IRON AGE.

CHILLED and SAND ROLLS. ROLLING MILL MACHINERY for Brass, Cop-
per, Lead, Silver, Britannia and other metals. TRANSMISSION MACHINERY.
RUBBER MACHINERY. MINING MACHINERY. Stone Breakers, Crushing
Rolls, etc. STONE WORKING MACHINERY. Planers, Headers, Diamond
Saws, etc. MACHINE MOULDED GEARING. GENERAL MACHINERY, Felt
Hardeners, Veneer Cutters, Shears, Hydraulic Presses and Pumps, Railroad
Cranes, etc., etc.

OTIS STEEL

"OTIS" FIRE-BOX PLATES A SPECIALTY.

FLANGE PLATES, SHIP PLATES, TANK PLATES.

STEEL AXLES of all kinds.

Steel Castings and Forgings.

Head Office and Works, CLEVELAND, OHIO.

Agencies: NEW YORK, 97 Cedar St. ST. LOUIS, 516 N. Third St
WASHINGTON, Kellogg Building.
MONTREAL, Homer Taylor, 183 St. James St.
SAN FRANCISCO, John Woodlock, 154-156 First Street.

**STEEL
CASTINGS**

FROM 1 to 40,000 POUNDS WEIGHT.
Of Open Hearth or Chester Steel.
True to Pattern. Sound. Solid.
Gearing of all kinds, Crank Shafts, Knuckles for Car Couplers
Cross-Heads, Rockers, Pistons-Heads, etc., for Locomotives
Steel Castings of Every Description.
CHESTER STEEL CASTINGS CO.,
Works, Chester, Pa. Office, 407 Library St., Philadelphia, Pa.

**BRAEBURN STEEL COMPANY,**
BRAEBURN, PA.Manufacturers of
Fine Tool Steel and Forgings. Also Spring,
Hammer, and Machinery Steel of high
quality. Fine Open-Hearth Steel.

DIRECTORS:
William Metcalf,
Charles Metcalf,
P. B. Hasbrouck.
R. P. Kelly,
Sec'y and Treas.

SOLID STEEL CASTINGS.

NEW ENGLAND STEEL CASTINGS CO.,
403 PROVIDENT BUILDING, PHILADELPHIA, PA.

CABEEN & CO.,
Real Estate Trust Building, PHILADELPHIA
Steel Billets and Slabs, both Bessemer and Open Hearth,
Pig Iron, Manufactured Steel, &c.



Hundreds of testimonials showing these castings
have proved the most satisfactory and economical
for all purposes requiring strength and durability.
CHROME STEEL WORKS,
Kent Ave., Keap and Hooper Sts., Brooklyn, N. Y.

C. R. Baird & Co.**PIG IRON,
Philadelphia.****Superior Charcoal Iron Co.,**
GRAND RAPIDS, MICH."Pioneer," "Antrim," "Elk Rapids,"
Lake Superior Charcoal Pig Iron.**OGDEN & WALLACE,**577, 579, 581 and 588 GREENWICH ST.,
NEW YORK.**IRON and STEEL.**BARS, ANGLES, TEES, BEAMS, CHANNELS, PLATES,
SHEETS, BANDS, HOOPS, ETC.

AGENTS FOR
THE FINISHED STEEL CO., Cold Finished
Steel Shafting, etc.
BRAEBURN STEEL CO., Tool Steel, etc.

**Red River Iron Co.'s
High Silicon Pig.****HICKMAN, WILLIAMS & CO.,**

EXCLUSIVE AGENTS,
CHICAGO, LOUISVILLE.
The Bookery. Kenyon Bldg.
PROMPT DELIVERY.

BARCLAY W. COTTON & CO

Successors to ESHERICK, COTTON & CO.

Iron and Steel Merchants,

AGENTS FOR

"CONTINENTAL" CORRUGATED FURNACES

418 Walnut St., PHILA.

L. & R. WISTER & CO.672 Bullitt Building,
Philadelphia.Dunbar Foundry Forge and
Basic Pig Iron.

Wyebrooke Cold Blast.

Dealers in all kinds of Scrap Iron and Steel.

HENRY LEVIS & CO.,**Manufacturers' Agents**For Iron and Steel Rails, Car Wheels, Boiler
and Sheet Iron and General
Railway Equipments.Old Rails, Axles and Wheels bought and sold
26 S. 15th St., Philadelphia.**E. H. WILSON & CO.**

FIDELITY BUILDING,

112 North Broad St., Philadelphia.

BROKERS AND DEALERS IN

IRON AND STEEL

Correspondence Solicited.

MIFFLIN WHEELER & CO.,

FORMERLY

Nicolls, Wheeler & Co.,

Fidelity Building, Philadelphia, Pa.
DEALERS IN**IRON AND STEEL SCRAP,**Pig Iron, Muck Bars, Charcoal Blooms, &c. &c.,
Steel and Iron Plates, New and Old Rails.**EDWARD J. ETING,**

Land Title Building, Philadelphia, Pa.

IRON, STEEL, PIG IRON.

AGENT FOR

Maryland Car Wheel Works, Car Wheels.

"Turner" Water Tube Safety Boilers.

"Mount Savage" Fire Brick.

"Pridmore" Molding Machines for Iron and
Brass Foundries."Whiting" Cranes, Cupolas, Air Hoists and
other Foundry Equipment.

"Standard" Pneumatic Tools.

CHARLES E. McINNES & CO.,**REFD. BAR IRON
and FORGINGS.**Fidelity Bldg., 112 No. Broad St.,
PHILADELPHIA.**J. K. DIMMICK & CO.,****PIG IRON.**

911 Drexel Building, PHILADELPHIA.

BOLE, ROSS & CO.

602 and 624 Park Building, Pittsburgh, Pa.

IRON AND STEEL.

Cable Address "METALFAC-CHICAGO" RBC CODE

E. H. STROUD & CO.
METAL FACTORS.*The Products of and Supplies for*
IRON STEEL TIN-PLATE BRASS
COPPER LEAD & ZINC WORKS.
36 La Salle Street & 100 William Street
CHICAGO. NEW YORK.**FLUID-COMPRESSED OPEN HEARTH STEEL***Hydraulically Forged and Annealed,*

leaves the engine-designer no excuse for broken shafts.

SEND TO OUR NEAREST OFFICE FOR PAMPHLET.

BETHLEHEM STEEL COMPANY,
South Bethlehem, Pa.BRANCH OFFICES:—100 Broadway, New York; 421 Chestnut St., Philadelphia; 1433 Marquette Build-
ing, Chicago; 312 Perry-Payne Building, Cleveland; 340-342 Main St., Cincinnati; 502 North
2d St., St. Louis; 430 Endicott Building, St. Paul; 726 Gravier St., New Orleans.**THE LLOYD BOOTH CO.,**
YOUNGSTOWN, O.HYDRAULIC MACHINERY—AUTOMATIC MILL TABLES.
GENERAL ENGINEERING.
TIN PLATE, IRON AND STEEL WORKS MACHINERY.**THE LORAIN FOUNDRY COMPANY,**
LORAIN, OHIO.

SAND AND CHILLED ROLLS.

HEAVY IRON CASTINGS IN LOAM, DRY and GREEN SAND,
MADE FROM CUPOLA OR AIR FURNACE.

BRASS and COPPER CASTINGS.



GEO. MESTA, PRES'T.

W. H. REA, TREAS.

J. O. HORNING, SEC'Y.

Mesta Machine Company,
Pittsburgh, Pa.,

SUCCESSORS TO

THE ROBINSON-REA MFG. CO., and
LEECHBURG FOUNDRY AND MACHINE CO.

MANUFACTURERS OF

**Rolling Mill, Steel Works and Tin Plate
Machinery, Machine-Molded Gears,
Ingot Molds, Chilled and Sand Rolls.**

EDWARD M. HAGAR & CO., Western Agents, "The Rookery," CHICAGO, ILL.

ESTABLISHED 1870.



ROLLS

EXCLUSIVELY, FOR ALL PURPOSES.

AETNA & CORLISS ROLLING MILL ENGINES



PINIONS, CHILLED & SAND ROLLS.

Rock Crushers

Rolling Mill & Tin Plate Mill Machinery

THE PHILADELPHIA ROLL AND MACHINE CO.

Makers of **HEAVY AIR FURNACE CASTINGS**, including

GUN CARRIAGES, ROLLING MILL MACHINERY,



GAS PRODUCERS AND FURNACES.

We make a specialty of Plate Straightening Machines and are prepared to furnish

TIN PLATE MILLS.

23d St. and Washington Ave., - - - **PHILADELPHIA, PA.**

JOHN H. RICKETSON, Prest.
A. G. BARNETT, Treas.

W. L. RICKETSON, Supt.

O. G. RICKETSON, Vice-Prest.
A. G. BARNETT, Jr., Sec'y.

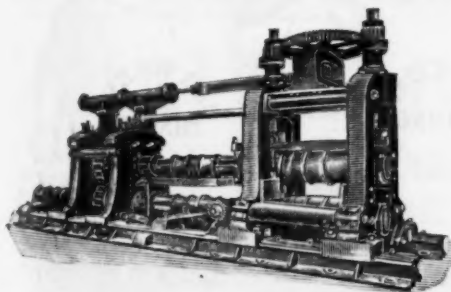
A. GARRISON FOUNDRY CO.

Manufacturers of Sand, Patent Homogeneous Steel and

CHILLED ROLLS.

ore and Clay Pulverizers, Rotary Squeezers, Haskin's Patent Double Spiral Pinions and Rolling Mill Castings of every description.

Office: South Ninth and Bingham Streets, **PITTSBURGH, PA.**



Frank-Kneeland Machine Co.,

54th St., **PITTSBURGH, PA.**

CHILLED, SAND AND STEEL ROLLS

Rolling Mill Machinery.

DIAMOND DRILL AND MACHINE COMPANY,
BIRDSBORO, PA.

Rolling Mill, Hydraulic and General Machinery

LIGHT AND HEAVY IRON CASTINGS.

"Royal" Rock and Ore Crusher, Diamond Drill, Belt-Lacing Machines.

Graphite Plumbago Silver Lead.

Manufactured for every known purpose, such as Foundry Facings, Lubricating, Stove Polish, Paints, Electrical, Electrotypes, Photographers, etc., etc. Send for samples and prices.

THE S. OBERMAYER CO.

(Graphite Dept.)

CINCINNATI, O., CHICAGO, ILL., U. S. A.

Cable address, "Esso," Cincinnati, O.

A. B. C. Code

PYROMETERS,
for
BLAST
and
ANNEALING FURNACES.

Guaranteed reliable, whether used constantly or intermittently.

UEHLING, STEINBART & CO., Ltd.

Carlstadt, N. J.

STEEL CASTINGS

OF EVERY DESCRIPTION.

10 lbs. to 75,000 lbs.

UNION STEEL CASTING COMPANY,

61ST ST., **PITTSBURGH, PA.**

GRAY IRON CASTINGS.

FINE, CLEAN AND SOFT.

SATISFACTION GUARANTEED.

WM. M. CRANE CO.

1131 and 1133 Broadway, N. Y. City.

Foundry, Peekskill, N. Y.

MALLEABLE CASTINGS,

High Tensile Strength.

BIKE STEEL CASTINGS,

Will Not Harden in Brazing.

CARBONIZED BIKE STEEL CASTINGS,

Will Temper Like Tool Steel.

ACME MALLEABLE IRON WORKS. - Buffalo, N. Y.

IRON CASTINGS

LARGE MODERN FOUNDRY,
WITH CAPACITY SUFFICIENT

FOR VERY PROMPT DELIVERY.

LARGE WORK A SPECIALTY.

FARREL FOUNDRY AND MACHINE CO.

ANSONIA, CONN.

FORGINGS

OF EVERY DESCRIPTION.

SEND YOUR SPECIFICATIONS TO
INDIANAPOLIS DROP FORGING CO.,
INDIANAPOLIS, IND.
Chicago Office, Old Colony Bldg.

Chemicals and
Chemical Apparatus

FOR

Steel and Iron Analysis,
CALORIMETERS,
PYROMETERS,
BALANCES.

Complete Laboratory Outfits.

EIMER & AMEND,
NEW YORK.

FROM THE QUAKER CITY



Manufacturers

FOUNDRY FACINGS and BLACKINGS.

J. W. PAXSON CO., Phila., Pa.

CASTINGS

WEST SIDE FOUNDRY CO.

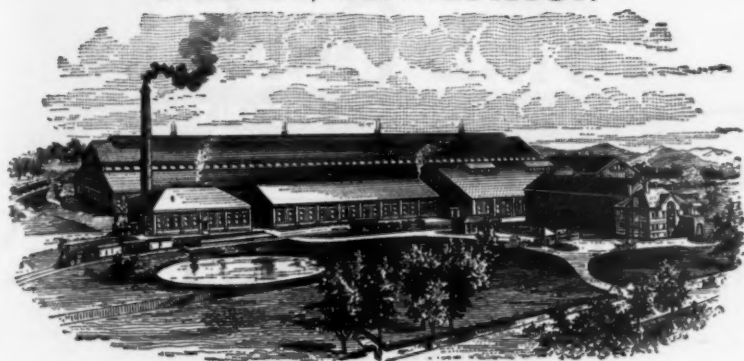
TROY, N. Y.

LIGHT GREY IRON
AND BRONZE CASTINGS.

CASTINGS

THE SESSIONS FOUNDRY CO.,

BRISTOL, CONNECTICUT.



Main foundry room 530 x 110 ft.

IRON CASTINGS. High Grade Castings, small and large. To Order.

ESTABLISHED 1850.

Malleable Iron

and Steel Castings.

Correspondence solicited. Prices given upon receipt of patterns or samples.

ARCADE
MALLEABLE
IRON CO.

WORCESTER, MASS.

WARREN, McFARLAND & CO.

GEO. B. BUCKINGHAM.

TRADE MARK.
Registered.

FOR CASE-HARDENING,

CARBURIZER is the most efficient material.

It penetrates deeper, requires less time and is cheaper on account of its specific weight than any other material now in use.

CARBURIZER does not corrode the article and iron or steel does not become brittle if properly treated. The Carbon projected into metal by our process is not lost if it be found necessary to reheat the hardened piece.

CARBURIZER contains no obnoxious substances and is ready for immediate use.

For full particulars address

AMERICAN CARBURIZING CO.,

160 Pearl Street, NEW YORK.

Factory, Warren and Bay Streets, Jersey City, N. J.

HERCULES PROCESS

STEEL CASTINGS.

Specialty: Difficult shapes and small cross sections. Strong, fibrous and free from blow holes, true to pattern, fine machinery qualities. For particulars ask for circular "G."

HERCULES STEEL CASTINGS CO., Harvey, Ills.

MALLEABLE IRON

SEMI-STEEL AND
GUN METAL

Castings and Fittings of Every Description

YORK MANUFACTURING CO.

YORK, PA.

NOTICE TO THE TRADE:
NO DIRT, NO SLAG, NO COLD SHOT.
NOTHING BUT IRON CASTINGS.

THE RANDOLPH IRON CO., Greenpoint, New York City.

MARINE,
MACHINE,
RAILROAD
And SHAFT

FORGINGS

Up to 30 in. Diam. or
15 Tons Weight.

FULLY FINISHED WORK A
SPECIALTY.

Write us for prices.

EASTERN FORGE CO.
OF MASS.,

72 Kilby Street,

BOSTON, - - MASS.

TIN MILLS

Plants complete from
Mills to Tin House.

F. R. PHILLIPS' SONS CO., - PHILA.

CASTINGS

WE have added to our plant a fully equipped foundry for making our own castings, and having larger capacity than we need for our own work, we solicit work in this department. We have excellent facilities for producing

LIGHT
GRAY-IRON
CASTINGS

promptly and in any quantity.

Work polished, nickel-plated or japanned.

CODLING MFG. CO.

Bristol, Conn.,

MANUFACTURERS OF THE

MODEL FLOOR and CEILING
PLATES.

E. R. ALLEN

MANUFACTURER OF

All kinds of soft, fine, medium and heavy
Grey Iron Castings to order. Boiler,
Heater, and Architectural Iron Castings
a specialty.

Send for Prices and Estimates.

Corning, New York.

CYPUS BORGNER CO.
Successors to CYPUS BORGNER
23rd ST. ABOVE RACE PHILADELPHIA, U.S.A.

FIRE BRICK
AND
CLAY RETORTS

MAKING
RETORTS
AND
FURNACES
TO ORDER

ESTABLISHED 1854.

HENRY MAURER & SON,
MANUFACTURERS OF
FIRE BRICK
of all Shapes and Sizes.
420 E. 23d St., New York.
Send for Illustrated Catalogue.

ESTABLISHED 1864.

GARDNER BROS., Successors to
James Gardner & Son.
Manufacturers of "Standard Savage"
Fire Brick for all Purposes.
Office, CUMBERLAND, MD., P. O. Box 240.
Agents: B. Wallace & Co., Baltimore, Md. Cleveland
Builders' Supply Co., Cleveland, O. E. E. Melick,
Crozer Building, Philadelphia.

Established 1848.

Ostrander Fire Brick Company
MANUFACTURE FIRE BRICK FOR
ALL PURPOSES.
Works at TROY, N. Y., and OSTRANDER, N. J.
Main Office, TROY, N. Y., to which correspondence
should be addressed.

PRESBREY
FIRE BRICK WORKS,
TAUNTON, MASS.
The Best Quality
FIRE BRICK
for
IRON or BRASS FOUNDRIES and
ALL FURNACES.
Send for Catalogue.

FIRE BRICK
FOR ALL PURPOSES.

Millions in stock. Extra quality
fire brick suitable for iron trade.
Largest stock in the State, all
shapes and sizes. Kiln brick, cupola
and furnace blocks a specialty.
Finest quality fire mortar and crude
clay. Shipments promptly any-
where. Send blue prints for our
prices on special work.

STATEN ISLAND CLAY COMPANY,
Woodbridge, N. J.

TUBING WORKS ESTABLISHED IN 1888.

SMALL SEAMLESS BRASS
TUBING.
1-32 to 1/2 inch in diameter—any Gauge.
Also German Silver Tubing.

SEND FOR QUOTATIONS.

WM. S. SPOFFORD & SON,
Providence, R. I., U. S. A.

FIRE BRICK
AND ENAMELED BRICK.
SHAPE WORK OUR SPECIALTY.
WORKERS OF CARTER CO. (KY.) CLAY.
CHAS. TAYLOR'S SONS CO., CIN., O.

M. D. VALENTINE & BRO CO.

FIRE BRICK

CUPOLA LININGS A SPECIALTY.

WOODBIDGE. N. J.

LIGHT GRAY IRON CASTINGS.
UNEQUALED IN SOFTNESS AND SUPERIOR FINISH.
On account of our immense facilities we can put patterns in sand on receipt of order.
Send trial order. Prices are right.

STANDARD FDY. & MFG. CO., Cleveland, O.

The FERRO-CARBON CASTINGS CO.,
FRANKFORD, PHILADELPHIA, PA.

JOHN HOSKIN, Pres't.

ALFRED C. REX, V. Pres't and Supt.

C. A. G. RIEGE, Sec. and Treas.

GEAR WHEELS,
CAR WHEELS,
CYLINDERS,
VALVES and
FITTINGS,
AGRICULTURAL,
ARCHITECTURAL
and HYDRAULIC
CASTINGS.



AXES,
HATCHETS,
HAMMERS,
CLEAVERS,
RAILROAD
and
MINING
TOOLS.

BEFORE USING.

AFTER 11 MONTHS' USE.

Founders of High Grade Castings of Atlas Metal and Manufacturers of
Superior Edge Tools and Tool Steel of Atlas Metal.
First Class Castings of this Metal, of any Weight, Size or Thickness, of Uniform
Structure and Properties Throughout.
Information and estimates upon application. Sample orders solicited.

THE ALLENTOWN ROLLING MILLS, Telephone
ALLENTOWN, PA. No. 1731.
Blast Furnaces, Rolling Mills, Foundry and Machine Shops.

MANUFACTURERS OF
GENERAL MACHINE SHOP AND FOUNDRY WORK.
Structural Iron Work, Highway Bridges, Castings, Etc. Railroad Switches, Frogs, Crossings, Etc. Railroad
Signals and Interlocking Apparatus for Steam and Trolley Roads.

GRAY IRON CASTINGS.
SOFT AND SMOOTH.
GEORGE L. ESTES,
Box 328, ROCHESTER, N. Y.

SCOTT DIBERT, PRES.
T. C. DU PONT, VICE PRES.

WM. H. HAWS, GEN. MGR.
JOHN H. WATERS, SECY.-TREAS.

INCORPORATED 1899.

W. H. HAWS FIRE BRICK CO.,

MANUFACTURERS OF

HIGH GRADE SILICA BRICK.

Special Shapes Made to Order.

Annual Capacity,
15,000,000.

Office and Works,
MT. UNION, Huntingdon Co., Pa.

Pittsburg Agent, DAVID DIBERT, 311 Penn Building.

FINE GRAY IRON CASTINGS.

True as a die to every outline of the pattern.

High Grade Brass and Bronze Castings.

PRICES RIGHT.

I. S. SPENCER'S SONS,

GUILFORD, CONN.

DIAMOND THIMBLES.

S. CHENEY & SON. - Manlius, N. Y.

DROP FORGINGS

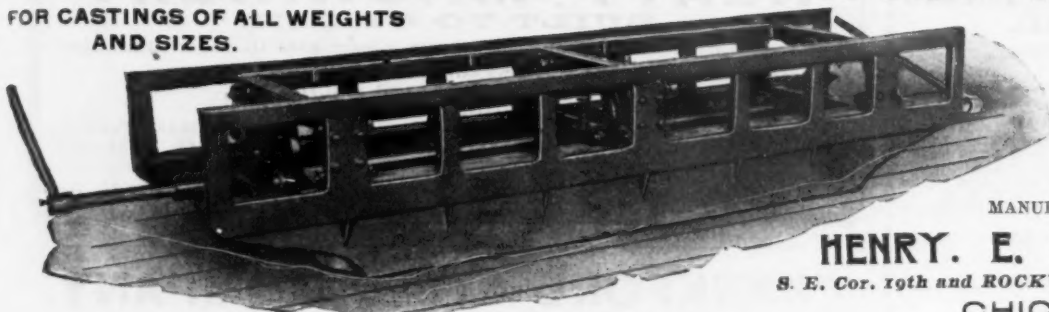
FOR
Tools, Steam Pumps, Machine Parts, Printing Presses,
Agricultural Implements, Automobiles,
Carriages and Bicycles.

FACTORY, - - - DERBY, CONN.

Consolidated Railway Electric Lighting & Equipment Co., 100 Broadway,
F. W. BENHAM, Manager Drop Forge Dept. New York.
JNO. N. ABBOTT, General Manager.
DERBY, CONN.

SAND MOLDING MACHINES.

FOR CASTINGS OF ALL WEIGHTS
AND SIZES.



Send
for
Circulars.

MANUFACTURED BY

HENRY. E. PRIDMORE,
S. E. Cor. 19th and ROCKWELL STS.,
CHICAGO, ILLS.

AGENCIES:

Edward J. Etting, Land Title Bldg., Phila., Pa., Agent for Western New Jersey,
Eastern Pennsylvania, Delaware, Maryland and Virginia.
D. F. Eagan, 31-33 State St., Boston, Mass., Agent for Maine, New Hampshire,
Vermont, Massachusetts, Connecticut, Rhode Island, Eastern New York and
Eastern New Jersey.
E. A. Wallberg, C. E., Western Loan & Trust Bldg., Montreal, Agent for Canada.
Glaesner & Perveaud, Paris, Agent for France.

W. C. Swift, Kopenicker Strasse 55, Berlin, S. O., Germany, General European
Agent.
J. W. Jackman & Co., No. 39 Victoria St., London, S. W., England, Agent for
Great Britain, Belgium and Holland.
Henry Pels & Co., Berlin, Agent for Germany.
V. Lowener, Copenhagen and Stockholm, Agent for Scandinavia.
Dino, Gatta & Co., Milan, Agent for Italy.

**Pittsburgh Shear Knife
and Machine Co.,**

47th St. and A. V. Ry.,
PITTSBURGH, PA.

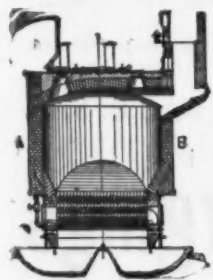
FORGINGS

Rough Turned or Finished Complete.

**SOLID STEEL
SHEAR KNIVES,
STEAM HAMMERS,
PUNCHES and SHEARS,
SPECIAL MACHINERY.**

SOFT GRAY IRON CASTINGS.

PHOENIX FOUNDRY, Smith & Caffrey,
Syracuse, - - N. Y.



WM. SWINDELL & BROS.,
German Nat'l Bank Bldg., Pittsburgh, Pa.

Open Hearth Furnaces; General and Steel Casting
Practice.
Soaking Pits—Highest Efficiency and Output.
Crucible Steel Furnaces.
Swindell Regenerative Heating Furnaces.
Swindell Recuperative System.
Swindell Continuous Water Seal Gas Producers.
400 Built in Past 3 Years.
300 Furnaces for all Purposes Built in Past 3 Years.

**HEAVY—
AND
LIGHT—
GREY
IRON**

CASTINGS.

We are thoroughly
equipped for con-
tract work.

**THE J. H. McLAIN COMPANY,
CANTON, O.**

BLACK STRAP MOLASSES

... FOR ...
ALL KINDS OF CASTINGS.

WRITE FOR QUOTATIONS AND SAMPLES.

N. W. TAUSSIG & CO., - 111 Wall St., N. Y.

**HIGH GRADE...
Malleable Castings.**

Prices given on receipt of sample castings.

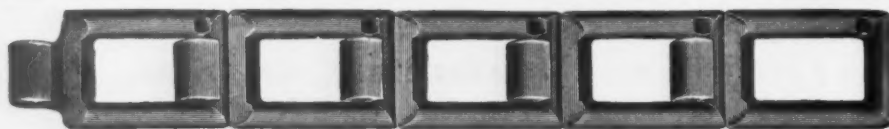
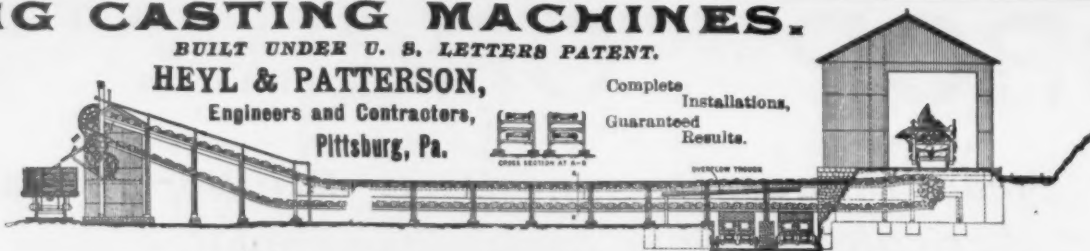
**MILWAUKEE MALLEABLE and
GREY IRON WORKS,
Milwaukee Wis.**

PIG CASTING MACHINES.

BUILT UNDER U. S. LETTERS PATENT.

HEYL & PATTERSON,
Engineers and Contractors,
Pittsburg, Pa.

Complete
Installations,
Guaranteed
Results.



Buhl Malleable Co., Detroit, Mich.

N. Y. Warehouse
and Office,
37 WARREN ST.
Alder & Boyd,
N. Y. SALES AGENTS.

"LION BRAND" ALLOYS
FOR STEEL.

Ferro-Chrome, 65% to 98%.
Ferro-Tungsten, 85%.
Tungsten Metal, 98%.
Ferro-Sodium. Silico-Spiegel.
Ferro-Silicon. Ferro-Nickel.
Ferro-Aluminum, 10%.
Ferro-Molybdenum.
Tungsten-Nickel. Chrome Nickel.
Molybdenum-Nickel, 75% M., 25% N.
Molybdenum Metal, Pure (Fused).
Ferro-Chrome, 68-70% Cr., less than
1% Carbon, and free from P. & S.
Also Copper Silicon, 15% Si., for Brass
Founders.
"S. A. M." Deoxidizing Alloy.
Malleable Pure Nickel.
Manganese-Copper.
Manganese-Zinc.
Manganese-Tin.
Manganese-Chromium.
Chromium-Copper.

Made by very special Patent Processes.

Chrome, Wolfram, Scheelite, Nickel,
Molybdenite and All Ores.

GEO. G. BLACKWELL, SONS & CO., Ltd.

The Albany, Liverpool, England.

Telegrams: "Blackwell, Liverpool," A B C and
Moreing & Neal's New General and Mining Tele-
graph Codes. Established 1899.

CABLE OR WRITE FOR PRICES.

HEAVY MACHINERY

BUILT TO ORDER.

Capacity up to 20,000 lbs. in single piece and 16 ft. in diameter.

CRUCIBLE AND OPEN HEARTH

STEEL CASTINGS,

1/4 lb. to 3000 lbs.

SPECIAL MACHINERY,

HYDRAULIC MACHINERY,

HIGH SPEED MACHINERY,

PIPE CUTTING MACHINES,

IMPROVED RAIL BENDERS.

Accuracy, Prompt Delivery.

IRON and STEEL FORGINGS.

P. HOLLINGSWORTH MORRIS, 1501 So. Front St., Philadelphia, Pa.

FRANKFORD STEEL COMPANY,
ELLWOOD CITY, LAWRENCE CO., PA.

STEEL FORGINGS,

Railroad, Marine and Machine. All shapes.

HEAVY SHAFTING.

IN THE ROUGH, ROUGH TURNED or FINISHED.

CHICAGO OFFICE, 1020-1021 Monadnock Bldg.,
Frederick H. Mason, Mgr.

Office, Fidelity Mutual Building,
PHILADELPHIA.

Chicago Drop Forge & Fdry. Co.

WORKS ESTABLISHED 1880.

DROP**FORGINGS**

Of All Kinds.

KENSINGTON, ILLS.

38 minutes South of Chicago
by Ills. Central R. R. Suburban trains.

PHENIX TUBE CO.,
Brooklyn, N. Y.,

BRASS and BRONZE**Iron Lined TUBES**

for Bedsteads and Railings. Prices on application.

DROP FORGINGS

THE KILBORN & BISHOP CO.

65-81 Lloyd Street.

NEW HAVEN, - CONN.

**SMALL
STEEL
CASTINGS**

That are moulded true to pattern.
That are of tough and uniform metal.
That are easily machined (no hard spots)
That are free from blow or sand holes.
That will take a fine polish.
THAT WILL HARDEN LIKE TOOL STEEL.

Send Samples for Prices Stating Quantity Required.

HOMER F. LIVERMORE,

85 and 87 PEARL ST. - - - BOSTON, MASS.

H. M. BRACKENRIDGE, Pres.

O. C. CAMP, Treas.

JAMES H. BAKER, Vice-Prest. and Gen'l Manager

JAS. H. BAKER MFG. CO.,

ORIGINATOR OF
Baker Wagon Hardware,
Baker Chain, etc.

Car Irons,
Wagon Hardware,
Air Brake Forgings,
Drop Forging and
Pressing.

Park Building, PITTSBURGH, PA., U. S. A.

Cable address:

"FORGINGS, PITTSBURGH."

All Telephones Long Distance.

Duplicate Forgings**WEATHERWAX MFG. CO.,**

BOONTON, N. J.

Manufacturers of Light Gray Iron

CASTINGS

and Hardware Specialties. Japanning, Bronze and Nickel Plating.

Castings finished, fitted and conveniently packed. Prompt delivery. Send samples, stating quantities required, for estimates.

Pennsylvania Engineering Works,

OFFICES and WORKS, - S. Jefferson Street, - NEW CASTLE, PA.

Blast Furnace and Steel Plant Construction, General Machine and Plate Work.

We build Pig, Hot Metal and Slag Cars, Charging Buggies, Large Ladles for Open-Hearth and Bessemer Plants, and Hydraulic Machinery.

We are specially equipped to build Heavy Shell Work, and solicit your inquiries.

H. C. FRICK COKE CO.,

Post Office, PITTSBURGH, PA.

Mines and Ovens in the Connellsville Coke Region, Penna. Headquarters for

GENUINE

CONNELLSVILLE COKE

For Blast Furnaces and Foundry Cupola Work; also Crushed Connellsville Coke (substitute for Anthracite Coal) for manufacturing and domestic purposes. 13,500 ovens. Daily capacity, 30,000 tons of Coke.

Direct Connections with all Railroads Entering the Region.

Quotations, Freight Rates, Pamphlets giving full information promptly furnished upon application.

FRICK COKE

Jones & Laughlins, Ltd.,

AMERICAN IRON AND STEEL WORKS, PITTSBURGH.

Branch House, Chicago, Ill. Branch Office, 220 Broadway, New York.

Cold Rolled Shafting, Pulleys, Hangers, Couplings

And Other Fittings for Power Transmission.

Our Cold Rolled Shafting is unequalled for quality and finish. Our Couplings, Hangers and Pulleys are of the highest grade, and especially designed for service and durability. Catalogue by mail upon request. Estimates promptly furnished. Large stock constantly on hand. Prompt shipments.

INSTALLATION OF COMPLETE MILL EQUIPMENTS A SPECIALTY.

M. M. COCHRAN, President.

J. R. LAUGHREY, Vice-Pres.

JOHN H. WURTZ, Sec'y & Treas.

J. S. NEWMYER, Manager.

WASHINGTON COAL & COKE CO.

5,000 Acres of Coal.

5,000 Tons Daily Capacity.

350 Individual Coal and Coke Cars.

YOUGHIOGHENY COAL

For Steel Works, Rolling Mills, Tin Plate Works, Locomotive Fuel, etc.

COKING COAL

For Bee-Hive or By-Product Ovens.

Our WASHINGTON COKE

Is unsurpassed for uniform purity and general satisfaction in Blast Furnace and Cupola Practice.

General Office,

Sales Office, Pittsburg, Pa.,

DAWSON, FAYETTE CO., PA.

N. P. HYNDMAN, Sales Agent.

BESSEMER COKE COMPANY, CONNELLSVILLE COKE

FURNACE, FOUNDRY AND CRUSHED COKE.

Mines and Ovens in Connellsville Region.

Offices, Lewis Block.

P. R. R., B. & O. R. R. and P. & L. E. R. R. Connections.

PITTSBURGH, PA.

CAPACITY, 75 CARS DAILY. INDIVIDUAL CARS.

THE MILLER ENGINEERING CO., Inc.,

SUCCESSORS TO

Miller Bros. & Co., Builders of

WESTINGHOUSE BLDG.,
PITTSBURGH, PA.

O. H., Tube Welding, Heating and Annealing Furnaces. Plants Built Complete. Best Work. Modern Designs and Guaranteed Results.

We Build the Best Gas Producer in the Market.

ALEX LAUGHLIN & CO
ENGINEERS
AND
CONTRACTORS.
PITTSBURGH, PA.

Builders of every description of
FURNACES AND GAS PRODUCERS
FOR IRON & STEEL WORKS.

DAVID LAMOND,

Contracting Engineer,
716 Ferguson Block, Third Avenue,
PITTSBURGH, PA.

Blast Furnace Construction. Patente
Central Combustion Chamber 4 Pass
Stove.

Agent for C. H. Foote Patent 2 and
Pass Fire Brick Stove.

HENRY AIKEN,

Consulting Mechanical Engineer,

Rooms 400, 401, 403, 404 and 408,
Lewis Block,
PITTSBURGH, PA.

The Wellman Seaver Engineering Co.,

Consulting and Contracting
Engineers,

NEW ENGLAND BUILDING,
CLEVELAND, O., U. S. A.

Cable Address, "Wellsea," Cleveland.

Steel Works, Rolling Mills, Metallurgical
Furnaces, Manufacturing Buildings,
Machinery for the most economical
handling of all kinds of material.

LONDON OFFICE:
47 Victoria St., Westminster.

ST. PETERSBURG OFFICE:
27 Great Morskaya.

THE LIMA STEEL CASTINGS

COMPANY, LIMA, O., U. S. A.

Open Hearth Steel Castings of Every Description
Send Specifications for Prices.

The S. R. Smythe Company.

Park Building, Pittsburgh, Pa.

Open Hearth "Steel Tube" and Rolling Mills Complete.

Smythe Gas Producers, 3 Types, most Advanced and Unequaled.

Steam and Hydraulic Machinery, "Buildings," etc.

NOTE.—OVER 100 PLANTS BUILT AND IN OPERATION.

G. W. McCURE, SON & CO.,

Successors to McClure & Amsler,

ENGINEERS AND CONTRACTORS,

SMITH BLOCK, - - - PITTSBURGH, PA.

BLAST FURNACE CONSTRUCTION A SPECIALTY.

Sole Representatives, U. S. A.,

MASSICKS & CROOKE'S PATENT THREE PASS FIRE-BRICK STOVES,
With McClure & Amsler's and G. W. McClure's Patent Improvements.

McCURE & AMSLER'S PATENT TWO PASS FIRE-BRICK STOVES,
With Center Combustion Chamber.

Open Hearth and Heating Furnaces, Soaking Pits, All Kinds Brick-Work.

Duff's Patent Water Seal Gas Producer.

Over 900 In Successful Operation.

Over 300 Under Construction.

INVESTIGATION SOLICITED.

THE DUFF PATENTS CO.,

924 Carnegie Building, Pittsburgh, Pa.

Open Hearth
Crucible
Annealing
Heating
Tube Welding

FURNACES

ED. E. ERIKSON,

Consulting
and Contracting
Engineer,

Garrison Bldg., Wood St. and
Third Ave., PITTSBURGH, PA.

WALTER KENNEDY, Engineer,

Blast Furnace Construction.

Bessemer and Open Hearth Steel Works.

Office: 631 PENN AVE., Pittsburg, Pa.

Telephone 3174.

S. V. HUBER & CO.,

CONSULTING ENGINEERS.

Blast Furnaces, Bessemer and Open Hearth Steel Works, Continuous Mills, Hoop Mills, Merchant Mills,
Automatic Mill Tables, Labor Saving Devices relating to Rolling Mills, Steam and Hydraulic Machinery.

Consulting and Constructing Engineers for the Republic Iron and Steel Co.

Telephone, Pgh. 3336. Rooms 702-707 Ferguson Building, Pittsburgh, Pa.

ROCKWELL ENGINEERING COMPANY,

FURNACE ENGINEERS;

Builders of **OIL, GAS, COAL FURNACES,**
Fuel Oil Burning Appliances.

Write for Catalogues.

HAVEMEYER BLDG., NEW YORK.

JULIAN KENNEDY, Engineer.

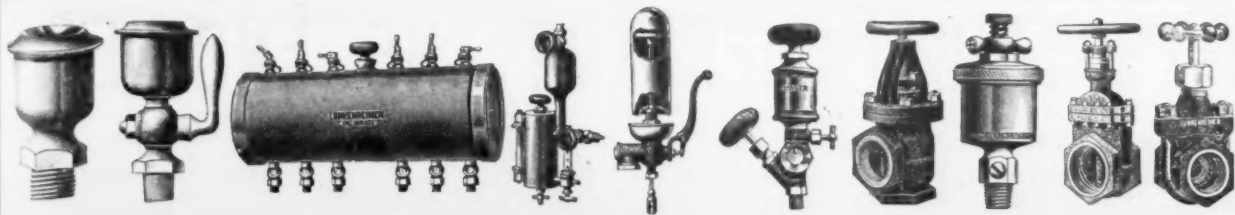
Pittsburg, Pa., U. S. A.

**MACHINERY AND PLANT FOR THE
ECONOMICAL PRODUCTION
OF IRON AND STEEL.**

Consultations and expert work in

GENERAL ENGINEERING PRACTICE.

Cable address, "ENGINEER PITTSBURG."



THE LUNKENHEIMER COMPANY,

Manufacturers of Superior Brass and Iron Valves, Whistles, Lubricators, Injectors,
Oil and Grease Cups, &c.

Write for Catalogue.

26 Cortlandt Street, NEW YORK.

35 Great Dover Street, LONDON, S. E.

General Offices and Factories: CINCINNATI, O., U. S. A.



Huxley's . . . Valve Remodeling Device. (Not a Refacer.)

Patented June 10, 1897.
FOR RENEWING SEATS IN
VALVES OF ANY PATTERN.
Interchangeable Seats
Allow Any Number
of Renewals.



Agents Wanted.

SHIPPED FOR TRIAL : :
TO RESPONSIBLE CONCERNS.

Send for Catalog.

QUINCY VALVE
and MFG. CO.,

Quincy, Ills., U. S. A.

R. D. WOOD & CO..

400 Chestnut St., PHILADELPHIA,

SOLE MAKERS OF THE

TAYLOR GAS PRODUCER.

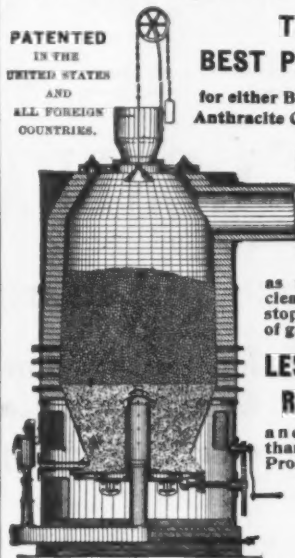
PATENTED
IN THE
UNITED STATES
AND
ALL FOREIGN
COUNTRIES.

THE
BEST PRODUCER
for either Bituminous or
Anthracite Coal or Lignite

CONTINUOUS
IN
OPERATION

as the fire is
cleaned without
stopping the flow
of gas.

LESS LABOR
REQUIRED
and less waste
than any other
Producer.



SEND FOR
PAMPHLET.

Gas Engine Plants,
Hydraulic Tools and Machinery.
Camden High Pressure Valves.

TILGHMAN'S PATENT

Sand Blast Machinery.

For removing the scale from castings
and metals of all kinds.

Send for
Catalogue.

Edgar T. Ward & Sons,
Sole Eastern Agents,
23-25 Purchase St.,
BOSTON, - MASS.

George Nash & Co.,
Sole Western Agents,
35-37 So. Canal St.,
CHICAGO, - ILL.



FOUNDRY LADLES

ALL SIZES, FROM
35 POUNDS TO 35,000 POUNDS CAPACITY

BYRAM & COMPANY,
FOUNDRY OUTFITTERS,
DETROIT MICH. U. S. A.



THE
CUPOLA
FURNACE

FACINGS FOUNDRY SUPPLIES

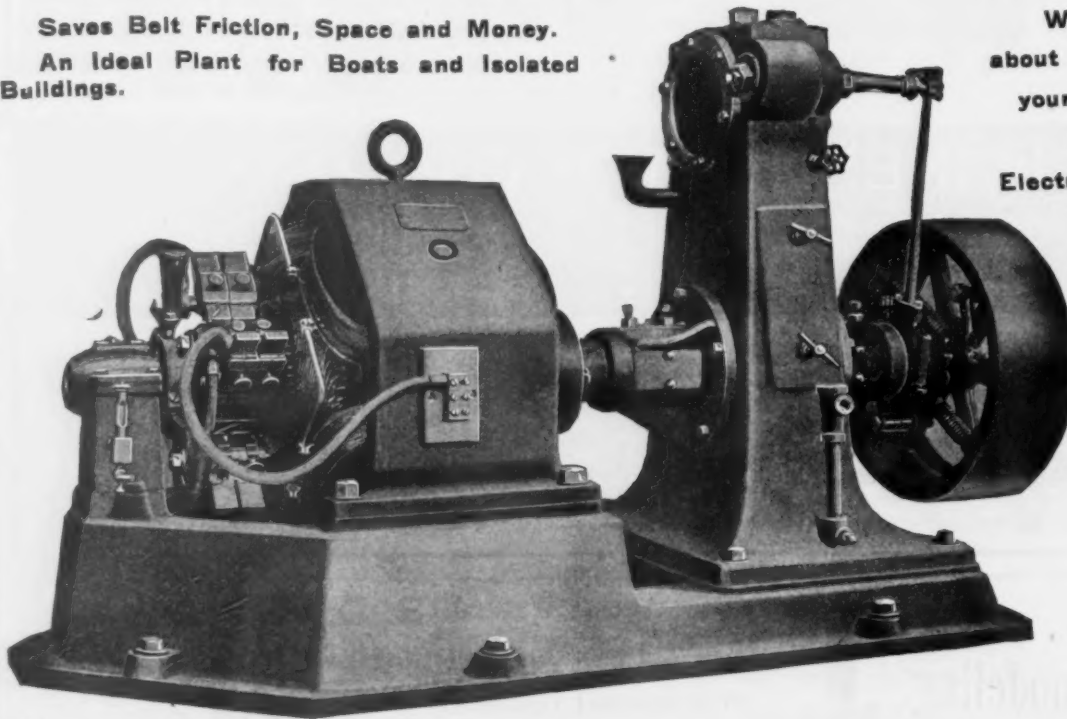
PERFECTION CORE BOXES.

THE CLEVELAND
FACING MILL CO.
Cleveland, Ohio.

Valves and Valve Gearing. A Practical Text
Book for the Use of Engineers, Draftsmen and
Students. With numerous illustrations, and four
folding plates. By CHAS. HURST 8vo. cloth \$3.00
For sale by David Williams Co., 232 William St., N.Y.

ELECTRIC GENERATOR AND ENGINE.

Saves Belt Friction, Space and Money.
An Ideal Plant for Boats and Isolated Buildings.



Write us
about equipping
your factory
with
Electric Power,
Electric
Light
Generators
Electro-
Plating
Dynamoes,
Etc.



SEND
FOR
CATALOGUE.

New York Office, 149 Broadway.

EDDY ELECTRIC MFG. CO., - WINDSOR, CONN., U. S. A.

THE GENERAL ELECTRIC COMPANY,

Makes and Sells Motors of all Sizes.

for direct connected or belt driven tools, for exhaust fans, blowers, cranes, hoists, factory railways and every other power purpose.

Main Office, SCHENECTADY, N. Y.
Sales Offices in all large cities.

NAUGATUCK		SEAMLESS	
GUARANTEED FOR ONE YEAR	FOR RECEIVERS STEAM TRAPS REGULATORS ETC.	TESTED TO 300 LBS.	
COPPER		FLOATS	
NAUGATUCK MFG. CO.		NAUGATUCK, CONN.	

Iron and Steel
HEAVY FORGINGS
OF EVERY DESCRIPTION.
TITUSVILLE FORGE CO.
TITUSVILLE, PA.

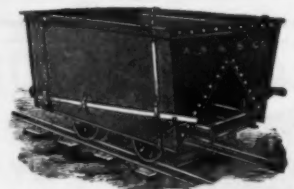


No. 161 CABLE BOTTOM AUTO-
MATIC DUMP.

CAR DEPARTMENT.
THE ATLAS BOLT AND SCREW CO.,
CLEVELAND, OHIO,

MANUFACTURERS OF SMALL CARS OF ALL
KINDS FOR ALL PURPOSES. STEEL CON-
STRUCTION A SPECIALTY. COMPLETE EQUIP-
MENT OF INDUSTRIAL RAILROADS. WHEEL-
BARROWS, ETC.

NEW YORK OFFICE: 29 BROADWAY.



No. 160 CABLE BOTTOM STEEL CAR.
Made in 4 sizes.

NICKEL PLATING

SENT FOR THE LIST OF
NICKEL & ELECTRO-PLATING
SUPPLIES & POLISHING MATERIALS.

ZUCKER & LEVETT
& LOEB CO

526 TO 530 WEST 25TH ST.

NEW YORK U. S. A.

OUTFITS.



Thousands in Use.

The Hobart Multipolar and Bipolar Dynamos, from 10 to 750 lights, and Motors from $\frac{1}{2}$ to 50 H. P. Noted for SIMPLICITY, DURABILITY and EFFICIENCY. Highest Quality at Most Reasonable Prices.

The Hobart Electric Mfg. Co., Penn Ave., TROY, O.

PIONEERS

LOW SPEED
DYNAMOS.
NICKEL
ANODES.
LACQUERS.

NICKEL PLATING OUTFITS

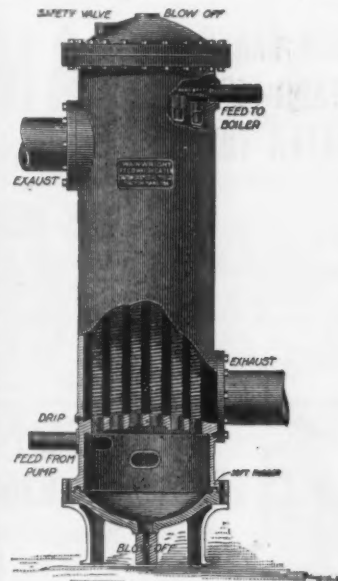
LEADERS

BUFFS.
CYANIDE POTASH
TURKISH EMERY.
POLISHING
MACHINERY.

THE HANSON & VAN WINKLE CO.
NEWARK CHICAGO NEW YORK

WAINWRIGHT Feed Water Heater,

with corrugated copper tubes. Allows for all expansion and contraction, and gives TWICE THE HEATING SURFACE in the same shell.

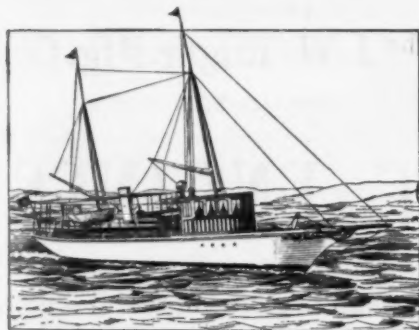


Our Catalogue explains it all.
Send for it.

Taunton Locomotive Mfg. Co.,
TAUNTON, MASS.

AGENTS:

CHAS. H. PAINE,
83 Liberty St., N. Y.
H. S. WALKER,
1509 Monadnock, Chicago.
TRACY ENGINEERING COMPANY,
151-153 Tremont St., San Francisco, Cal.
H. M. FIFE,
321 N. Main St., St. Louis.



YACHTSMEN

Making the selection of Power
for Yachts or Launches

A Question of Quality

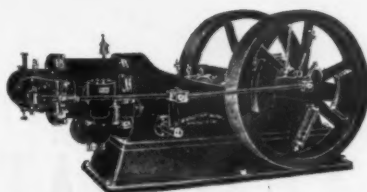
Can decide only on the

DAIMLER MOTOR.

Motors in sizes from 1 H.-P.
to 50 H.-P.

Boats of all sizes and types from a 16-ft.
Tender to a 125-ft. Yacht.

DAIMLER MFG. COMPANY,
945 Steinway Ave.,
LONG ISLAND CITY, N. Y.



HIGH GRADE AUTOMATIC GAS AND GASOLINE ENGINES,

All Sizes up to 200 Actual H. P.

Combines economy and safety of the ideal gas engine with the reliability and close regulation of the automatic steam engine. Especially adapted to electric lighting and other exacting service requiring long interrupted runs. If you buy the best you will use the "Burger" built by

The Woolley Foundry and
Machine Works,

ANDERSON, IND.

Send for circular.

Up-to-date Manufacturers

do not need to be told that feeding boilers with cold water is as obsolete as flint-lock guns, and the manufacturer "not up-to-date" will not "keep" long in our American climate. Which is the best Feed Water Heater? is a question that perplexes many who have not investigated THE WEBSTER FEED WATER HEATER AND PURIFIER. Would you like to investigate it? and shall we help you do so?

WARREN WEBSTER & CO.
CAMDEN, N. J.

PHILADELPHIA, 1106 Stephen Girard Bldg.
NEW YORK, 322 Broadway.
CHICAGO, 1509 Monadnock Bldg.
BOSTON, 729 Tremont Bldg.



McNAB & HARLIN MFG. CO.,

— MANUFACTURERS OF —

BRASS COCKS and VALVES

FOR STEAM, WATER and GAS.

Wrought Iron Pipe and Fittings, Plumbers' Materials, Seamless Brass and Copper Tubes.

56 and 60 JOHN ST., N. Y.

Catalogue and Price-List will be sent to the Trade with their first order, or by express, if desired, before ordering.



Blast Furnaces,
Steel Plants,
Boilers, Tanks, etc.

THE WM. B. POLLOCK COMPANY,
YOUNGSTOWN, O.

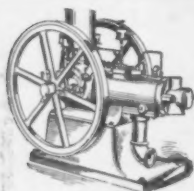
Draft Stacks,
Riveted Steel Pipe,
Tank Cars.

IRON TANKS.
STAND PIPES.
WATER TOWERS.

ANNEALING BOXES.

WARREN CITY BOILER WORKS. WARREN, O.

BOILERS.
DRAFT STACKS.
RIVETED PIPE.



THE MIETZ & WEISS GAS and KEROSENE ENGINES.

Burns **KEROSENE**. Cheaper and safer than Gasoline. Automatic; simple and reliable. **NO** electric battery, **SELF IGNITION**. Perfect regulation. Belted or directly coupled to dynamo for electric lighting **AND ALL POWER PURPOSES**. Send for catalogue.

A. MIETZ, - - 128-138 Mott Street, N. Y. City.

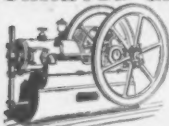
Markt & Co., Ltd., London, Hamburg and Paris.



ASHTON VALVES and GATES.

Send for Catalogue "A."
ASHTON VALVE CO.,
Boston, Mass.

CHARTER GASOLINE ENGINE.



Used Any Place,
By Any One,
For Any Purpose.
Stationaries, Portables,
Engines and Pumps.
State your Power Needs or
your Customers' Power Needs.

Charter Gas Engine Co., Box 624, Sterling, Ill.

Small Engines Now Ready.

Horizontal, Vertical, Automatic,
Direct Connected and Slide Valve.

BOILERS.

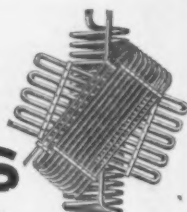
F. W. IREDELL, 26 Cortlandt St., New York.

PIPE COILS AND BENDS

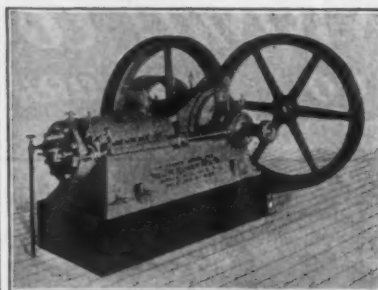
Of Every Description.
Made of Iron, Brass or Copper,
Pipe or Tube.

SEND FOR CATALOGUE.

WHITLOCK COIL PIPE CO.,
Elmwood, Conn., U. S. A.
Telegraph address, HARTFORD.



The Fenner Gas and Gasoline Engines



FOR
ELECTRIC LIGHTING

And Every Other Power Purpose.

Absolute Regularity,

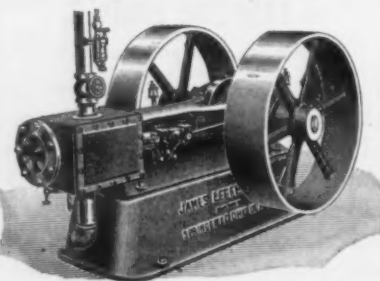
No Noise, Little Fuel.

SEND FOR DESCRIPTION

The J. W. Ruger Mfg. Co.,

BUFFALO, N. Y., U. S. A.

AUTOMATIC ENGINES



From 10 to 50 H. P., with finest governing system, best possible regulation, and with highest economy in steam guaranteed.

We also Build Plain Slide Valve
ENGINES AND BOILERS

From 3 H. P. and up.

Pamphlet with full information, by stating wants and addressing

JAMES LEFFEL & CO.,

Box 78,

Springfield, Ohio, U. S. A.

Extra Heavy Rough Brass Unions

And Brass Castings For All Purposes.

Phosphor Bronze for Machine Box Bearings, Etc.
Special Finished Brass Work to Order.

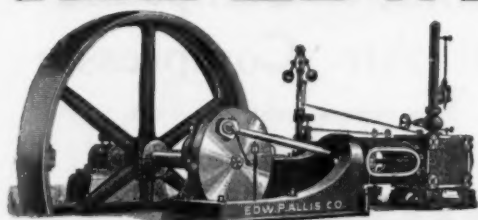
NOLTE BRASS CO., 29-31 W. Jefferson St.,
SPRINGFIELD, O.



THE EDWARD P. ALLIS CO.

MILWAUKEE, WIS.

— MANUFACTURERS OF —

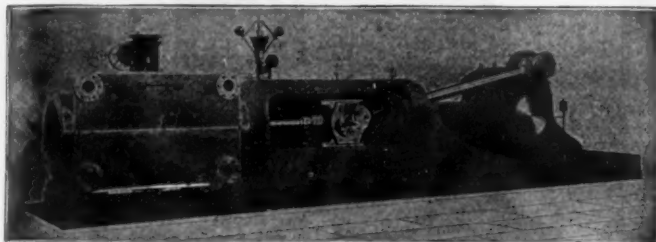


REYNOLDS CORLISS ENGINES,

Pumping, Blowing and Hoisting Engines,
AIR COMPRESSORS and SPECIAL ENGINES for
Rolling Mills, Electric Lights and Street Railways.

BRANCH OFFICES:

New York, Chicago, San Francisco, Minneapolis, Denver, Pittsburgh, Salt Lake City, Kansas City.



Eastern Representative, T. W. PHILLIPS, 4 Market Square, Providence, R. I.

THE FILER & STOWELL CO.,

MILWAUKEE, WIS.

HEAVY DUTY CORLISS ENGINES.

Best Design. Best Efficiency. Best Workmanship.

Condensers,
Compressors,Pumping Machinery.
Power Transmissions.

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO.

WORKS AT NEWPORT NEWS VA.
(On Hampton Roads.)

SHIP AND ENGINE BUILDERS.

Equipped with a Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

For estimates and further particulars, address C. B. ORCUTT, Pres't, No. 1 Broadway, New York.

SOUTHWARK FOUNDRY & MACHINE CO.

PHILADELPHIA, PA.,

BUILDERS OF THE

PORTER-ALLEN AUTOMATIC CUT-OFF ENGINE.

Used extensively in Rolling Mills and Steel Works; also for electrical purposes. High economy. Close regulation.

Also builders of Blowing Engines for Blast Furnaces; Reversing Engines for Steel Works; Centrifugal Pumps; Rotary Pumps; Weiss Condensers, etc.

INQUIRIES SOLICITED.

WILLIAM TOD & CO.

YOUNGSTOWN, OHIO.



THE PORTER-HAMILTON ENGINE.

Reversing Engines, Blowing Engines, Converters, Hydraulic and Special heavy machinery for the iron and steel trades.

For Direct Electrical and all High-Class Work

SEWARD S. BABBITT, Park Building, Pittsburgh.

THE GEO. B. SENNETT CO.,

YOUNGSTOWN, OHIO.

Manufacturers of the

SENNETT ROCKING GRATE.

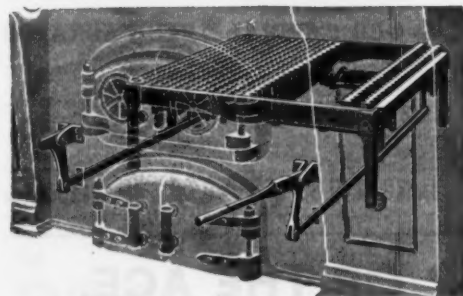
Economy of Fuel.
Economy of Time.
Prevents Large Clinkers.
Convenient and Substantial.
Apply for circulars.

We also make

SENNETT ENGINE

20 to 40 H. P.

Sennett Compression Coupling and Castings to 5 tons each.



BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS CO., Publishers and

Booksellers, 232-238 William Street, New York.

TABOR STOP MOTION COUNTER

Send \$1 for Sample.
Liberal Discount
to the trade.
Ask your dealer for
it.Builders of Foundry
Molding Machines.

THE TABOR MFG. CO., ELIZABETH, N. J.

REDUCING VALVES

to control or reduce
steam, water or air
pressures.

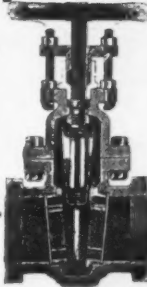
MASON

Valves have had a
world wide reputa-
tion for years.

Write for prices.

MASON REGULATOR CO., BOSTON, MASS.

Chapman VALVES

FOR
All Purposes.Water, Gas,
Steam,
Ammonia,
etc., and
Fire
Hydrants.SEND FOR
CATALOGUE.CHAPMAN VALVE MFG. CO.,
Indian Orchard, Mass.



Thorough Inspections

AND

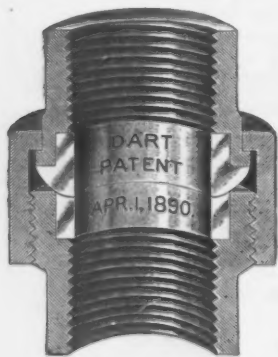
Insurance Against Loss or Damage
to Property and Loss of Life and
Injury to Persons caused by

Steam Boiler Explosions.

J. M. ALLEN, President.
WM. B. FRANKLIN, Vice-President.
F. B. ALLEN, Second Vice-President.
J. B. PIERCE, Secretary and Treasurer.
L. B. BRAINARD, Asst. Treasurer.
L. F. MIDDLEBROOK, Asst. Sec'y.

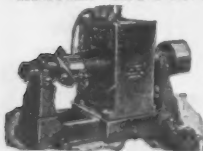


Send for a Sample of
Morrison's Patent Self-Lubricating Packing.
ROBT. MORRISON,
5034 Arsenal Street, - St. Louis, Mo.



The
**BEST
UNION**
Made in
The U. S.
M'fd by the
E. M. Dart
Mfg. Co.,
Providence, R. I.
Send for circulars and prices.

MAYER MOTORS AND DYNAMOS



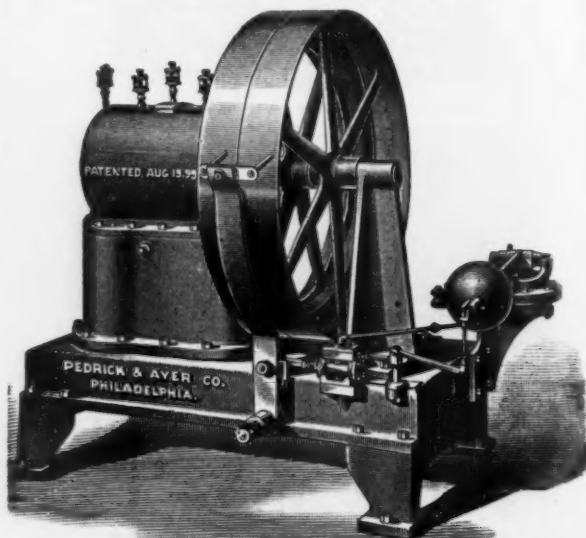
For Light, Power
and PLATING, are
efficient, simple
and reliable. . . .
Medium and Slow Speed
M. M. Mayer Elec. Co.
2369-2d Ave., N. Y.
Salesroom, 123 Liberty St.



Straight Lift Hoist.

Automatic Compound Belt Air Compressors.

PATENTED AUGUST 13th, 1893.



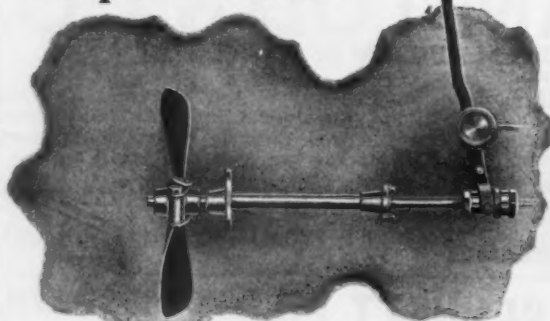
Built in two sizes, Nos. 1 and 2.

No.	Size of Cylinders in inches.	Revolutions per Minute.	Cubic Feet of Free Air.	Horse Power required.	Size of Pulleys in inches.	Shipping Weight of Compressor	Floor Space in inches.	Telegraphic Symbol.
1	11x6 6x6 15x10 8x10	100-160 90-120	32-50 90-120	2-3½ 9-15	40x5 60x6	3875 lbs. 5370 lbs.	60x40 76x60	Parian Pariah

Pedrick & Ayer Co.,

Spring Garden Station, PHILADELPHIA, PA.
Manning, Maxwell & Moore, Sole Agents, 85, 87, 89 Liberty St., New York City.
22 So. Canal St., Chicago, Ill. Park Bldg., Pittsburgh. 26 So. Water St., Cleveland, O.

Adjustable Reversible Propeller Wheels.



TRUSCOTT BOAT
MFG. CO.,
ST. JOSEPH, MICH.

High-Grade
Pleasure Craft.

Manufacturers of
**Vapor
Marine Motors.**

Largest and best equipped
plant of its class.
Send 5 stamps for catalogue.



The OLD "SPIRAL" FLUE SCRAPER

JACKSON FLUE SCRAPER CO., Jackson, Mich.

BEST STOKER OF THE AGE.

Steam consumers can burn soft coal without smoke and save 20 per cent. Furnace door never opened. No loss of heat. No cleaning of fires. No clinkers. No coal thrown in the ash heap. These easily make an additional saving of 10 per cent.

THE IDEAL FUEL FEEDER CO., 31 Burling Slip, New York.

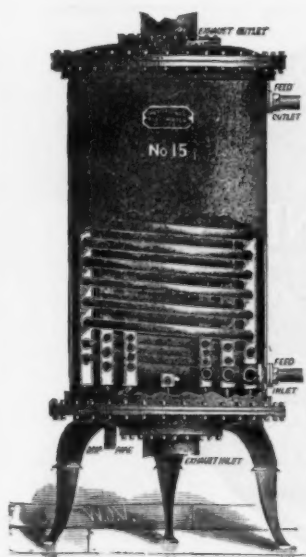
900,000 HORSE-POWER IN DAILY USE

— OF —

The National Feed Water Heaters,

OUR RECORD FOR 16 YEARS.

LOOK OUT FOR IMITATIONS WITH LESS HEATING
SURFACE.

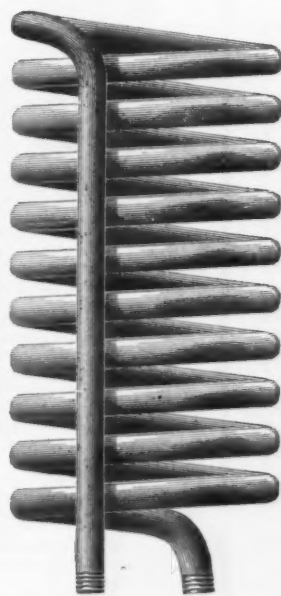


We make the *ORIGINAL* and *ONLY*
GENUINE FIRST-CLASS COIL
FEED WATER HEATERS.

The National Pipe Bending Co.,

164 River St.,
NEW HAVEN, CONN.

ALSO MAKERS OF ALL KINDS OF
COILS OF IRON, BRASS AND COPPER PIPE, AND THE
CHEAPEST AND BEST HOT WATER AND HOT AIR
COMBINATION STOVES AND FURNACES.

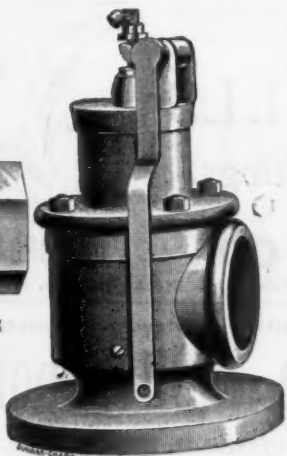


CROSBY VALVES AND GAGES

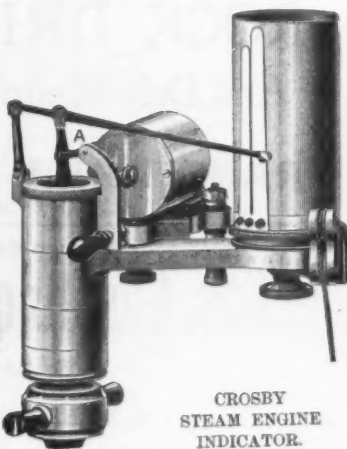
Our catalogue shows our very complete line.
Send for it.

Please mention *The Iron Age*.

SPRING SEAT GLOBE
and
ANGLE VALVES.



POP
SAFETY VALVES.



CROSBY
STEAM ENGINE
INDICATOR.



IMPROVED
PRESSURE GAGE.

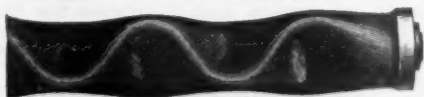
Crosby Steam Gage & Valve Co.,

Office and Works, BOSTON, MASS.

Stores: NEW YORK, CHICAGO, and LONDON, ENG.

THE
ROW
INDENTED
TUBE.

DOUBLE THE EFFICIENCY OF PLAIN ROUND TUBE.



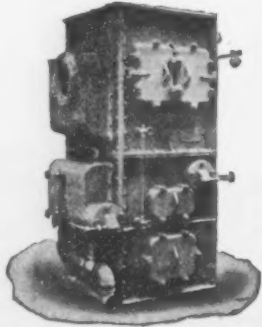
OUR
Catalogue

Tells all about it.
Send for a copy.

THE HEAT TRANSMISSION CO. 40 Mable Ave., Danbury, Conn.



COCHRANE Special Heaters and Receivers.



The simpler you can make a steam heating system—that is, the fewer contraptions there are to it—the less it will cost you to install and operate that system.

For instance: It is the common practice to pass the exhaust steam through a closed heater for the purpose of heating the boiler feed supply, and then to send the balance of the exhaust steam into the heating system. It is particularly desirable to save all of the condensed exhaust, because this represents a considerable quantity of water, because of its freedom from scale-forming matter, and because of the heat which it contains.

To make these savings, using a closed heater, you must place an independent oil separator in the exhaust main ahead of the heater and provide a trap for drainage, if the exhaust is under back pressure. In many cases the drip from the heater is thrown away, being passed to waste through a steam trap. To save these drips, and also the condensation coming back from the heating system, it is necessary either to provide a return tank, or else an automatic receiver pump for returning direct to the boilers. In either case it is necessary to introduce at some point a certain amount of cold water for supplementing the condensation, which will not represent the full amount of water demanded by the boiler; the regulation of the amount of cold water thus introduced is usually effected by hand manipulation of the valve; occasionally the supply of cold water for supplementing is regulated by means of a float in the return tank.

Now, if one of our
**Cochrane Special Heaters
and Receivers**

is used the need for all of these separate and independent appliances is obviated, since the heater itself takes the place of the independent oil separator, its trap—the closed heater, its trap—the return tank—the automatic control of the fresh water—the extra pump, etc. You save all of the extra piping required to connect up the separate appliances, and you have a close system, automatic and reliable, which makes use of all of the heat in the exhaust steam and which gives the greatest possible purification to the feed supply.

These Special Heaters are well worth looking into when you are ready to make changes or to put up a new plant.

**HARRISON SAFETY BOILER
WORKS,**

Col. Sta., PHILA., PA.

THE BABCOCK & WILCOX Co.

29 CORTLAND ST.
NEW YORK
CABLE ADDRESS
"GLOBEBOXES"
ALL FOREIGN OFFICES
"BABCOCK"

WATER TUBE

BOILERS

SEND FOR OUR BOOK "STEAM"

BOSTON
8 OLIVER ST.
PHILADELPHIA
943 BEXEL BLDG.
SAN FRANCISCO
26 FIRST ST.

BRANCH OFFICES
CHICAGO
309 MARQUETTE BLDG.
NEW ORLEANS
312 CARondelet ST.
PITTSBURGH
107 CARNEGIE BLDG.

ATLANTA, GA.
299 EQUITABLE BLDG.
ST. LOUIS MO.
415 CHATEAU BLDG.
HAYANA, CUBA
31 CALLE DE LA ANAGUA



Air and Gas Compressors.

Simple and Multiple Stage. Belt
or Rope Driven, Standard Types.
Special Patterns.

ROCK DRILLS And Drill Mountings.

RAND DRILL CO., - 100 BROADWAY, NEW YORK.
1328 Monadnock Block, Chicago, Ill.



Second Edition—Revised and Enlarged.

"Gas, Gasoline and Oil Vapor Engines."

By GARDNER D. HISCOX, M.E.

AMERICAN PRACTICE.

384 Pages. Illustrated with 270 Handsome Engravings.
Octavo, Cloth, \$2.50.

A book designed for the general information of every one interested in this new and popular motive power, and its adaptation to the increasing demand for a cheap and easily managed motor requiring no licensed engineer.

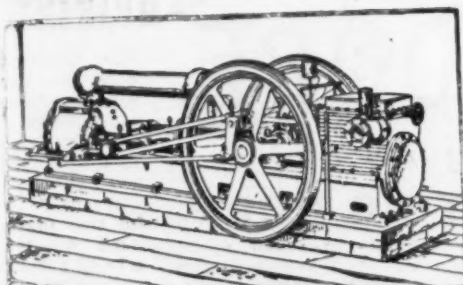
The book treats of the theory and practice of Gas, Gasoline and Oil Engines, as designed and manufactured in the United States. It also contains chapters on Horseless Vehicles, Electric Lighting, Marine Propulsion, etc.

Address all orders and inquiries for books to

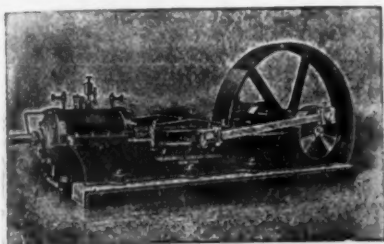
DAVID WILLIAMS COMPANY,

Publishers and Booksellers.

232-238 William St., New York



THE NORWALK IRON WORKS CO.
SOUTH NORWALK, CONN., MAKERS OF
AIR AND GAS COMPRESSORS FOR ANY
VOLUME AND FOR ANY PRESSURE.



AIR

COMPRESSORS.

40 Styles. 300 Sizes.

These Air Compressors are all of the highest grade of manufacture and suitable for every application of compressed air.

Complete catalogue of Mining, Tunneling and Quarrying Machinery.—The Air Lift Pump.

Rock Drills.



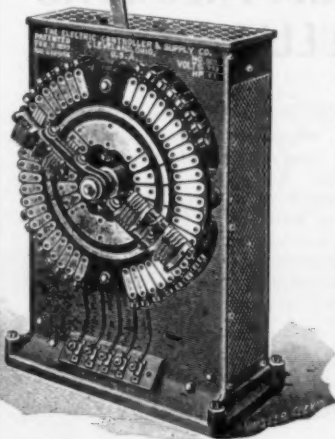
THE INGERSOLL-SERGEANT DRILL CO.,

Havemeyer Building, New York.

FOR ALL **AIR COMPRESSORS** AIR USES
 SEND FOR CATALOGUE
NEW YORK AIR COMPRESSOR CO.
 120 LIBERTY ST NEW YORK, U.S.A.

The ONLY... **Thoroughly Ventilated Controller** on the Market.

Hundreds in use by THE CARNEGIE STEEL WORKS.



(Dinkey Ventilated Controller.)

Write for particulars,
THE ELECTRIC CONTROLLER AND SUPPLY CO.,
 31 Michigan St., Cleveland, O., U.S.A.

Hose Washers

For the Spring Trade.

Write at once for Prices.

H. O. CANFIELD,
 434 Myrtle Ave.,
 BRIDGEPORT, CONN.

Manufacturers of Molded Boiler Gaskets, Pipe Unions, Bumper Tips, and all classes of Molded Rubber Work for Mechanical Purposes. Estimates for molds and all kinds of work on application.

Correspondence Solicited.

AIR COMPRESSORS

FOR EVERY APPLICATION OF COMPRESSED AIR POWER.

CLAYTON AIR COMPRESSOR WORKS,
 16 Cortlandt St., - - - NEW YORK.
 Complete Catalogue upon Application.

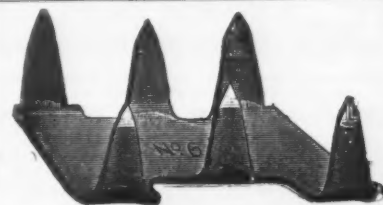


TUBE WELL SUPPLIES.

COOK'S PATENT
 TUBE WELL STRAINERS
 AND
 STEAM PUMPS
 A SPECIALTY.

SEND FOR CATALOG.

A. D. COOK,
 Sole Manufacturer,
 Lawrenceburg, Ind., U. S. A.



THE KENEHAN SOFT STEEL BELT FASTENER

Send for Prices.

We do all kinds of METAL STAMPING.
THE CLAY STAMPING CO., - Cleveland, O.

THE JEFFREY MFG. COMPANY
COLUMBUS, OHIO, U. S. A.
Elevating Conveying Machinery.
Designed to Suit all Conditions.



CENTURY RUBBER BELT CONVEYER. Estimates and Plans Cheerfully Submitted. Send for Catalogues. New York Branch 41 Dey Street.



**Gilbert
Wood
Split
Pulleys.**

SAGINAW MANUFACTURING CO.,

SAGINAW, MICH., U. S. A.

New York Branch: 44 Dey St.

Sales Agencies in all the Principal Cities.

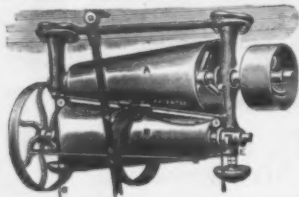
Cable address: ENGRAVE. A B C and Lieber's Codes

**CHAIN
HOISTS.**

One man lifts eight tons, and lifts it easier, faster and safer with SPEIDEL'S IMPROVED ECONOMIC SAFETY HOIST than with any other made. Let us send you our catalogue A and prices.

J. G. SPEIDEL,
Reading, Pa.

EVANS FRICTION CONE PULLEYS.



For varying speed of machine while running.

6,000 sets in operation, transmitting from 1 to 40 H.P.

Send for Illustrated Catalogue to

G. F. EVANS, 85 Water St., Boston, Mass.
O. W. BURTON GRIFFITH & Co., London Agents.

"STEVEDORE" GUARANTEE

**TRANSMISSION AND
HOISTING ROPE.**

MADE from the finest selected cut Manila Stock. Particular care taken to have the twist of the threads and the lay of the strands exactly suited to the work to be done. A plumbago lubricant used in laying up this rope reduces the internal friction and makes it nearly water proof. Particulars on application to the works direct. A new Rope Catalogue, No. 9998, just issued.

C. W. HUNT CO., DAVIS AVENUE, WEST NEW BRIGHTON, N. Y. CITY.

The Guarantee goes with every rope we sell that more work can be done with it, in proportion to cost, than with any other rope on the market, and we will gladly refund the difference in price if our rope is not all we claim.

FAIRMOUNT MACHINE CO.,

Twenty-second and Wood Sts., Philadelphia, Pa.

Shafting, Gearing, Self-Oiling Bearings, Friction Pulleys, Rope Transmission, Freight Elevators.

Looms, Harness Motions, Dobbies, Machinery for Winding, Spooling, Reeling, Beaming, Warping, Dyeing, Sizing, Scouring, &c.

**BOX'S
DOUBLE SCREW
CHAIN HOISTS.**
(PORTABLE.)

ALL CAPACITIES



RANGING TO 20,000 LBS.

HOIST HOOKS.

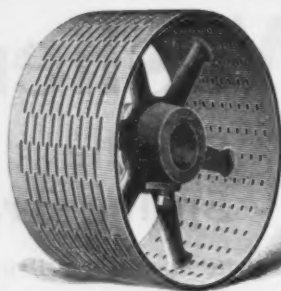
DROP FORGED from BAR STEEL.



SUPERIOR in STRENGTH and FINISH.

WRITE FOR LIST AND NEW DISCOUNT SHEET.
ALFRED BOX & CO.,
Front and Poplar Sts., PHILADELPHIA.
Hoists and Trolleys, Hand or Electric, for
Travel on Lower Flanges of I Beams.

Keystone Drop Forge Works,
PHILADELPHIA, PA.



**THE NEWELL PATENT
PARA PNEUMATIC
PULLEY.**

THIS Pulley will be found most efficient in connection with the running of Dynamos, Electric Motors, or High Speed Machinery of any character. It

effectually prevents the belt-slipping nuisance with its loss of power. It will not heat, saves belts, and by permitting slack ones, it greatly reduces wear of bearings, etc. The "Newell Para" is pre-eminently the Pulley for any unusually arduous service. If you have pulley troubles "of your own" it will pay you to investigate this one.

GEORGE V. CRESSON COMPANY

18th Street and Allegheny Avenue

NEW YORK, 141 Liberty St.

PHILADELPHIA, U. S. A.

No 10.



DOES TWO THINGS

AND DOES THEM THOROUGHLY.

Stops the Belt from slipping,

Pleases the Man who uses it.

NOTHING EQUALS IT.

Sample size FREE. Send for one.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

London Office, 28 Victoria St., Westminster.



Without A Rivet,

Thus insuring a smooth inside surface and free delivery. Any gauge or length of bucket to 16 feet long, of one continuous body piece.

THE CLEVELAND

ELEVATOR BUCKET CO.,

OFFICE AND FACTORY,

225 St. Clair Street, Cleveland O., U. S. A.

ROPE TRANSMISSION

Shafting, Pulleys, Ring Oiling Bearings, Gearing,
Friction Clutch Pulleys,

PULLEY MOULDING MACHINES,

PULLEY LATHES.

T. B. WOOD'S SONS, - Chambersburg, Pa.



SALEM ELEVATOR BUCKETS.

THE W. J. CLARK CO.,
SALEM, OHIO.

LEVIATHAN BELTING

is stronger, transmits more power and lasts longer than any other Belt. It runs successfully in Steam, Water and Extreme Heat.

Belts for Main Driving and work of a heavy nature a specialty.



**MAIN BELTING
COMPANY,**

Sole Manufacturers,

1219-1235 Carpenter St.
PHILADELPHIA.

55-57 Market Street, Chicago.

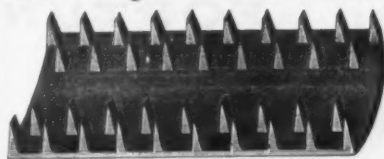
120 Pearl Street, Boston.

ALEXANDER BROS.

BEST OAK Belting

412 N. Third St., Phila.

Talcott's Original Wilson Belt Hooks.

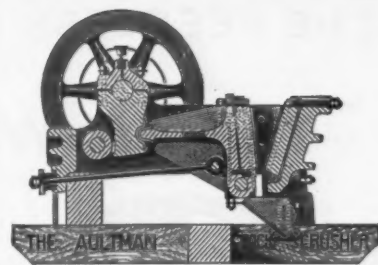


W. O. TALCOTT, Providence, R. I.

MANUFACTURER OF

170 VARIETIES OF BELT HOOKS.
SEND FOR CATALOGUE.

AULTMAN



Rock Crushers and Screens.

Elevating and Conveying Machinery

Portable Engines and Boilers.

Our Catalogue is cheerfully mailed to those interested. Write us.

THE AULTMAN COMPANY

904 South Market Street,
CANTON, OHIO.



This trade-mark inspires confidence in the quality.

FIRE HOSE.

We manufacture an extensive line of reliable fire hose, adapted for outside or inside use, in all sorts of industrial establishments, public buildings, etc.

WRITE FOR CATALOGUE.

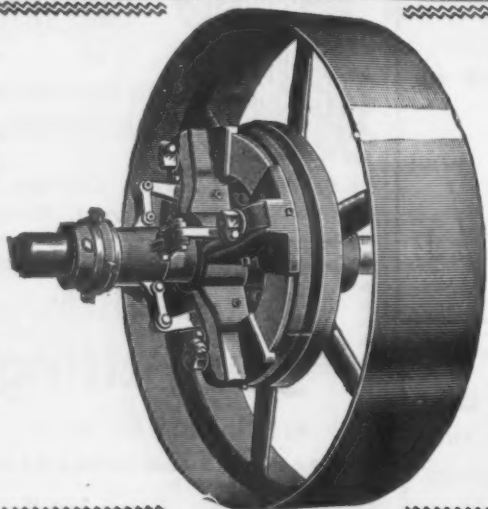
BOSTON BELTING CO.

James Bennett Forsyth, Mfg. Agt. and Gen. Mgr.

High Grade Mechanical Rubber Goods.

Boston, New York, Buffalo, Chicago

When it's
about
RUBBER
ask us.



Friction Clutches for Every Kind of Service,
Clutches which Give No Trouble,
Clutches which Take Hold,
Clutches which Let Go,
Clutches which Do Not Stick,
Clutches with Ample Strength,
Clutches that are Not Overrated.

Write for Full Information to

The Eastern Machinery Co.,

146 Ashmun St., New Haven, Conn.

FORTUNE RUBBER BELTING,

Absolutely the finest and most durable Rubber Belt yet produced.

Every belt tested before leaving factory.



We have the most modern and extensive belt machinery in the world and guarantee satisfaction in every instance.

MANUFACTURED EXCLUSIVELY BY

THE PEERLESS RUBBER MANUFACTURING COMPANY

16 Warren Street, New York.

16-24 Woodward Ave., Detroit, Mich.

202-210 So. Water St., Chicago, Ill.

17-19 Beale St., and 18-24 Main St., San Francisco, Cal.

The All-Wrought Steel Split Pulley.

Patented and Patents Pending in U. S.

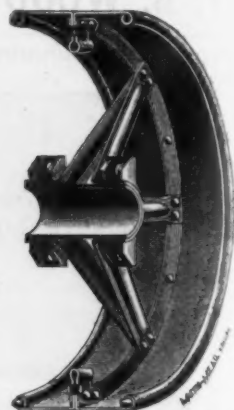
Patented Throughout the World.



INTERCHANGEABLE METAL BUSHINGS
TO FIT
ALL SIZES SHAFTING.

Sold by the best Hardware and Supply
Houses all over the World.

SEND FOR CATALOGUE AND PRICES.



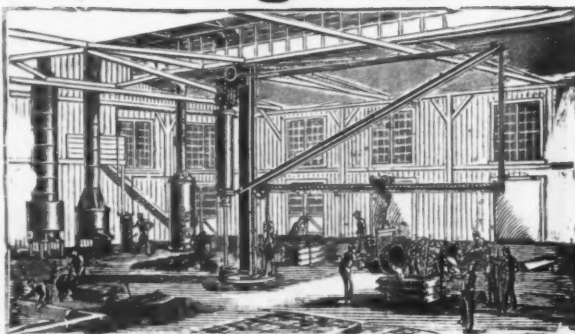
THE AMERICAN PULLEY COMPANY, - Philadelphia, Pa.

"Say, Look Here, Ridgway."

"We had your cranes up at the Soandso Works, when I was General Manager there, and they saved us so much money that I want to get them here in this plant as soon as I can. I wish you would go through the works and make a note of the places where you can put your cranes to advantage. Then come back and see me."

This is exactly what the new General Manager of a large Iron and Steel Co. said to the writer the other day. Mighty good advertisement for Ridgway Cranes, isn't it? Well, we did as we were asked, we went through the works, and soon another big concern will be equipped with Ridgway money makers.

This, however, is no special case. Just happens to be the last one is why we mention it. This kind a' thing is happening right along all the time. As soon as a "Boss" who has used Ridgway Cranes moves to a new place the very first things he asks for are Ridgway Cranes. The reason is not far to seek. He being a new man in the place naturally wants to please his superiors who own the pocket-book. Nothing pleases like increasing profits. When Ridgway Cranes are put in you ought to hear 'em say: "Our new man is just a Jim Dandy." Nothing increases profits and straightens out a plant like hitchin' the boiler to the lifting with a Ridgway Crane.



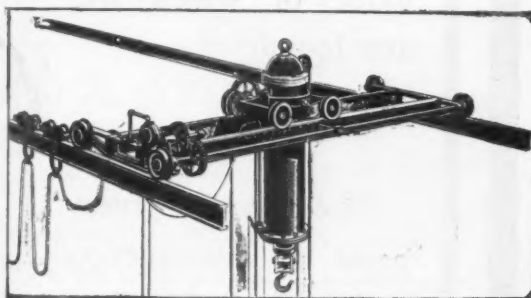
5-Ton Steam Hydraulic Crane in a Foundry.

Hydraulic Air Hoists.

Yes, kill somebody, will you? An Air Gun to handle a ton with. Of course it is a man trap. Wait until you hurt or kill somebody and a jury gets a chance at you and you will see whether it pays to use dangerous air hoists because they are cheap and an Oil Governed absolutely safe hoist costs more money to build it. Workmen and lawyers are learning about Ridgway Hoists. You should be able to say you adopted the safest and best hoist you knew. A word to the wise is sufficient.

"Please Take the Elevator."

THEY ALL DO IT.



CRAIG RIDGWAY & SON CO.,
COATESVILLE, PA.

EUROPEAN AGENT,
CHAS. G. ECKSTEIN,
16 Spandauerstr.,
BERLIN, - - GERMANY.

JUSTLY PROUD IS UNCLE SAM OF THE

DODGE MANUFACTURING CO.,

CONTRACTORS, ENGINEERS, FOUNDERS & MACHINISTS.

INDEPENDENCE WOOD SPLIT PULLEY

OVER 2,000,000 IN DAILY USE.

WORKS AND MAIN OFFICE
MISHAWAKA, INDIANA, U.S.A.

BRANCHES:
NEW YORK, CHICAGO,
BOSTON,
ATLANTA, LONDON, ENG.

SELL THE BEST THE "SURE GRIP" Steel Tackle Block

Is taking the place of all other hoisting Blocks.

Send for catalogue and discounts.

Fulton Iron & Engine Works,
28 Brush St., Detroit, Mich.
ESTABLISHED 1882.

—OR—
RICE LEWIS & SON, Ltd.,
TORONTO, CANADA.

The "King" Chain Block

With Patent Automatic Friction Brake.

1000 to 20,000 lbs. Capacity.

Portable Beam Punches.
Hand Punches and Shears Combined.
Scroll and Screw Punches.
Sheet Iron Shears.
Clamp Drills.

CHAS. G. ECKSTEIN,
249 Centre St., New York.

MORSE,
WILLIAMS
& CO.
Morse Elevator Works.

Manufacturers and Builders of
ELECTRIC, HYDRAULIC, BELT and HAND POWER PASSENGER and FREIGHT ELEVATORS.

Broad St. and South Penn Square,
PHILADELPHIA.
104 So. Gay St., Baltimore, Md.

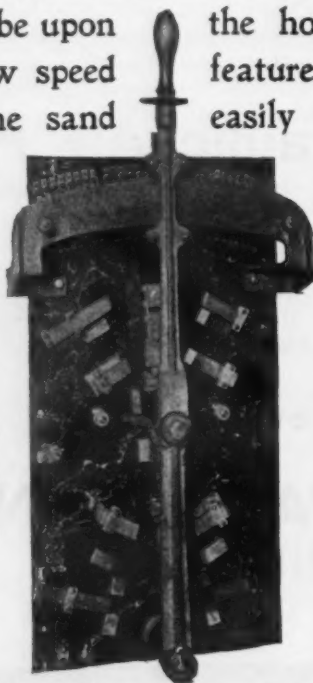
108 Liberty St., New York.
19 Pearl St., Boston.
82 Church St., New Haven.

Our Reversible Controllers

... FOR ...

ELECTRIC CRANES AND HOISTS

Regulate the speed of the motor from normal to 10 per cent. of the normal without the use of mechanical brakes and without regard to the load which may be upon the hoist. The practical advantage which this slow speed lifting patterns from the sand value of which will easily be appreciated by any foundryman



Strength at every point of construction makes C. & H. Controllers the most durable and reliable.

Our Controller will give better control over a motor on the hoist than anything else on the market.

Reversible Crane Controllers.



MAIN FACTORY.

43,000 square feet, devoted exclusively to the manufacture of Rheostats.

The Cutler-Hammer Manufacturing Co.,

MILWAUKEE, WIS., U. S. A.

The Largest and Oldest Exclusive Manufacturers of Rheostats in the World.

SEND FOR ILLUSTRATED CATALOGUE "B" AND LIST OF USERS.



LINK-BELT ELEVATORS, CONVEYORS.

ATTENTION TO DETAILS.

It is highly important that the wheels of Elevating, Conveying and Power Transmitting Machinery should accurately fit the chains with which they are to run. All "Link-Belt" wheels are finished in the manner shown by accompanying cut. This treatment, very essential to the long life of both wheels and chain, is mentioned to illustrate the care given all details of our machinery.

"Modern Methods" Catalogue Mailed on Request.

LINK-BELT ENGINEERING CO.,
NICETOWN, PHILA. 49 DEY STREET, NEW YORK.

CALIFORNIA WIRE WORKS,

9 FREMONT STREET, SAN FRANCISCO, CALIFORNIA,
MANUFACTURERS AND CONTRACTORS.

Single and Double Rope Tramways and Cableways.

HALLIDIE PATENT ROPEWAYS,

for transporting ore, fuel, merchandise, sugar cane, etc. Hallidie Patent Combined Scraper and Conveyor, plows and scrapes earth, etc., and conveys any distance.

Grip Pulleys, Improved Durable Wire Ropes.

Estimates and Designs Furnished. Send for Catalogue.



COAL and ORE HANDLING MACHINERY, HANDLING MACHINERY for SHIP YARDS.

The Brown Hoisting & Conveying Machine Co.,

NEW YORK OFFICE, Havemeyer Building.
PITTSBURGH OFFICE, Carnegie Building.
LONDON OFFICE, 39 Victoria Street, Westminster, S. W.

CLEVELAND, OHIO, U. S. A.

CRANES OF ALL TYPES,
Electric, Steam and Hand Power.



"Tested and Reliable."

Cranes .. AND ..
AIR HOISTS.

COMPLETE - - -
FOUNDRY EQUIPMENTS.

Engineers and Designers
OF FOUNDRY PLANTS FOR THE
Manufacture of Car Wheels and Pipe,
O.H. Steel and Malleable Castings.



Whiting Foundry Equipment Co.

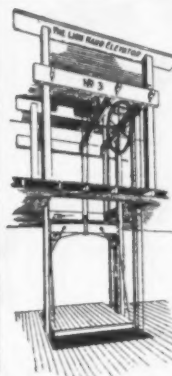
General Offices and Works:
HARVEY, ILL., U.S.A.,
156th Street.



BAILEY'S
Steel or Iron
PORTABLE
HOIST.

2 ton, 4 ton, 8 ton and 10
ton. One man can raise
capacity of each Hoist.
Users' patronage solicited.

JAMES P. DUNN,
MANUFACTURER,
37 & 39 Bank Street,
CLEVELAND, O.



FRANKLIN MACHINE
WORKS,

St. Paul, Minn.

ROBT. SIGEL, Mgr.

Manufacturers of first class

HAND AND
POWER
ELEVATORS.

Send for circular.

TOOL GRINDERS

For Accurate Grinding of all Tools.

LABOR SAVING

William Sellers & Co. Inc.
PHILADELPHIA, PENNA.

MACHINE TOOLS.

DENISON Suspended
Weighing Machine.

Accurate from
one pound to
125 tons.



WESTON'S RATCHET.



Double Ratchet. Double Pawls.
Strong and Reliable.
Sizes 12 in. to 24 in.

WRITE FOR PRICES.

JOS. F. MCCOY CO.,

26 Warren Street,

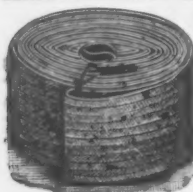
NEW YORK.



FRANK BURGESS, Prop.,

Purchase and Pearl Sts., Boston, Mass.

Send for Gear Catalogue H. Over 200 sizes of Gears



AMES SWORD CO.

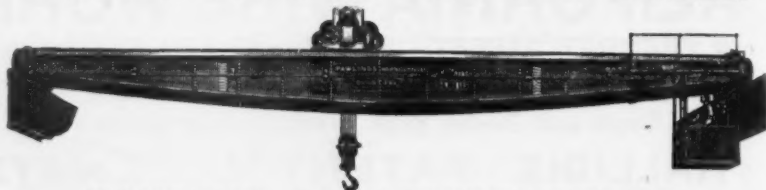
Chicopee, Mass.

Manufacturers of

Endless Silk Sewed
Polishing Belts.

CORRESPONDENCE SOLICITED
DISCOUNTS QUOTED

ELECTRIC AND HAND TRAVELING CRANES.



PAWLING & HARNISCHFEGER,

Chicago Office, G. P. NICHOLS & BRO., Managers,
1325 Monadnock Bldg.

Pittsburgh Office, W. P. LINDSLEY, Mgr.,
Fidelity Building.

161 Clinton Street,
Milwaukee, Wis.

New York Office, A. A. DeBONNEVILLE, Mgr.,
Bowling Green Bldg.

- CRANES -



NORTHERN ENGINEERING WORKS

NO 3 CHENE ST.
DETROIT, MICHIGAN.

CLEVELAND CRANE AND CARCO
OF ALL KINDS
FOR ALL PURPOSES
116-138 WASON ST.
CLEVELAND O.

READING CRANE & HOIST WORKS
READING, PA.

HAND POWER TRAVELING CRANES in all sizes and styles.
SPUR GEARED CHAIN BLOCKS with Patent Automatic Friction
Brake from $\frac{1}{4}$ ton to 20 tons capacity.

Overhead Tracks, Trolleys, Switches, Etc.

The name WARNER on ELECTRIC
ELEVATORS means Safe, Economical, Durable.

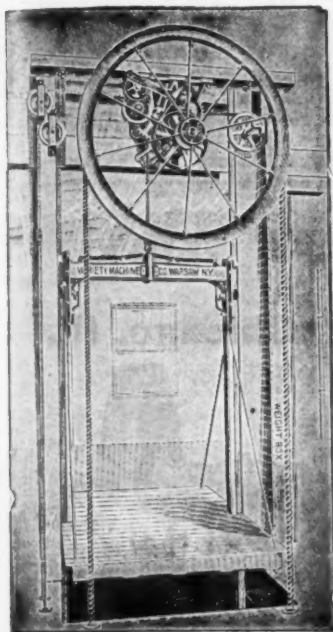
Largest Factory in the U. S. out of the Combine.

ESTABLISHED 1860.

CINCINNATI, O.

GEO. M. SCOTT,
Bellows Manufacturer,
Johnson Street,
Cor. 22d St.,
CHICAGO, ILL.





Our Elevators have steel roller bearings throughout—made upon the same principle of a ball bearing bicycle—that's why they run so easy and smooth. They are easy to erect and any "handy man" can do it, because the winding machine or overhead gearing is all securely bolted together before shipment and our instructions and blue prints tell you where each piece goes, so you can't make a mistake.

ELEVATORS.

DUMB WAITERS.

For Hand or Power, Freight or Passenger Service.

SEND FOR CATALOG.

VARIETY MACHINE CO.,

Warsaw, New York, U. S. A.

NEW YORK AGENTS:

WHITE, VAN GLAHN & CO., 15-16-17 Chatham Square, 49 E. 42d St., New York.

ORE SHOVELS.

For handling Iron Ore, Coal, &c., at Mines, on Docks, or in Blast Furnace Yards

Detailed information furnished on application.

THE THEW AUTOMATIC SHOVEL CO.,
LORAIN, OHIO, U. S. A.

WATER TUBE BOILERS.

I make Water Tube Boilers from 5 to 100 H. P. They are all self-contained, need no setting of any kind, but are ready for steam on arrival. They are in use both for stationary and marine work. Pressures from 225 down. My boilers have no castings under strain, and are wholly steel-plate and straight tubes. Send for my illus. catalog.

EGBERT P. WATSON,

Elizabeth, N. J.



Chain Hoists.

1000 to 20,000 lbs.
capacity.

Trolleys.

All kinds.

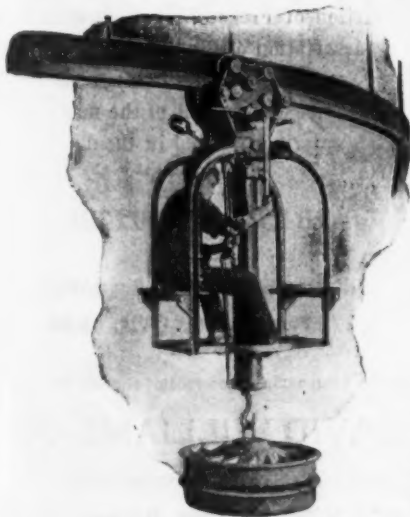
Best in the market.

Send for catalogue.

Allegheny Machine Co.,

309-313 Anderson St.,

Allegheny, Pa.



Pneumatic Self-Traveling Trolleys.

Adapted to any service where weights and substance in bulk is to be handled, doing away with hand labor. The only overhead automatic device having perfect mobility, traversing any distance, turning corners, switching from one track to others, running on to transfer tables, covering any desired rectangular space, quick acting, economical to operate and maintain, free from fire risk and suitable for the mercantile business as well as manufacturing.

Write for Information and Prices.

PNEUMATIC CRANE CO.,

Builders of Overhead Traveling Cranes,

26th and Liberty Sts.,

PITTSBURG, PA.

Engineers and Contractors Wanted in all Large Cities to Introduce and Handle Our Trolleys and Cranes.

If you want to keep your Emery, Corundum or Carborundum Wheels true, in good shape and best cutting condition use a Reliable Diamond Tool.



Send for Descriptive Catalogue and Price-List.

THOS. L. DICKINSON, - - 45 Vesey St., New York City.



Bridgeport Safety Emery Wheel Co.,
BRIDGEPORT, CONN., U. S. A.

Patentees and manufacturers of Emery Wheels
and Emery Wheel Machinery. Send for prices.

WRITE AND ASK
US ABOUT . . .

Emery Wheels

WITH
SPOHN'S PATENT SAFETY
APPLIANCE.

SOMETHING NEW AND THE BEST ON
THE MARKET.

Scranton Corundum & Emery Wheel Co.
SCRANTON, PA.

HIGH GRADE
Buffing and Polishing
Wheels.

Our Catalog tells the
story. Write for it.

DIVINE BROTHERS COMPANY,
UTICA, N. Y.

Patent Tumbling Barrels.

MANY VARIETIES
For all Kinds of Work.
Send for new Catalogue.

HENDERSON BROS., WATERBURY, CONN.

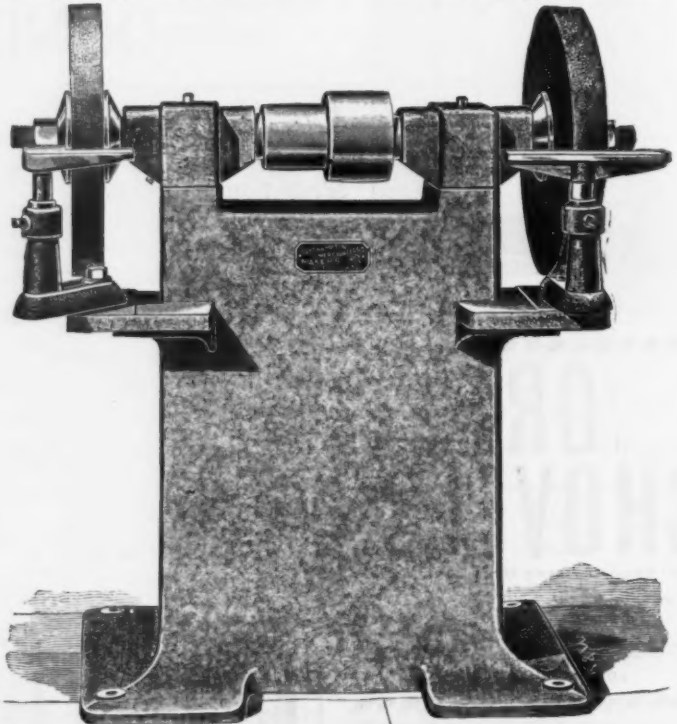
WANTED.
SPECIAL MACHINERY and
TOOLS TO BUILD.

NAZEL & BASSETT,
Engineers and Machinists,
1046 Ridge Ave. PHILADELPHIA.

Northampton Emery Wheel Co.,

Leeds, Mass.

Chicago, Ill.

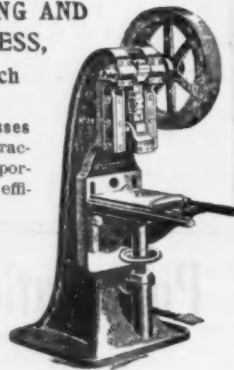


No. 3 H Machine, 1 9-16 inch Arbor, Carries 20 inch Wheels.
COMPLETE CATALOGUE ON APPLICATION.

No. 39 HORNING AND
WIRING PRESS,
with Safety Clutch
Device.

Power Punching Presses
for all purposes, of prac-
tically perfect propor-
tions and highest effi-
ciency. Built on
honor, sold right.

W. H. Hibbard,
83 Washington
Street,
BROOKLYN, N. Y.



PRESS-WORKING OF ...METALS...

A Treatise upon the Principles and Prac-
tice of Shaping Metals in Dies by the
Action of Presses, together with a
description of the construction of
such implements in their va-
rious forms, and of the ma-
terials worked in them.

BY

OBERLIN SMITH.

Illustrated with 433 Engravings.
276 Pages. 8vo. Cloth, \$3.00.

Sent, postpaid, on receipt of price, by

DAVID WILLIAMS CO.,

Publishers and Booksellers,

232-238 William Street, N. Y.

Automatic Machinery

FOR WIRE AND SHEET METAL GOODS.

Power Presses.

THE AUTOMATIC MACHINE CO.,
Bridgeport, Conn.

NORTON

EMERY

WHEELS



NORTON EMERY WHEEL CO.

1900

PARIS EXPOSITION.

DEPARTMENT OF

MACHINERY AND ELECTRICITY.

CHAMP DE MARS :
BLOCK 5, SPACE 3.

VINCENNES :
BLOCK 1, SPACE 2.

WORCESTER MASS.

20 YEARS

of Grinding have Demonstrated to Thousands of Practical Mechanics that the STERLING EMERY WHEEL

IS THE BEST FOR
EFFICIENCY AND DURABILITY.

May we not demonstrate this fact to you? Write for catalogue.

STERLING EMERY WHEEL MFG. CO., Tiffin, O.

New York, 45 Vesey St.

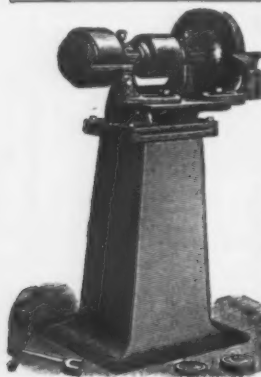
Boston, 68-70 Pearl St.

Chicago, 47-49 S. Canal St.

San Francisco, 21-23 Fremont St.



L. BEST,
45 Vesey Street
New York.



OUR GRINDERS
WITH OUR
HIGH SPEED
CHUCK

for Emery Rims
are the BEST
OUT.

SPRINGFIELD
MFG. CO.,
Bridgeport, Ct.

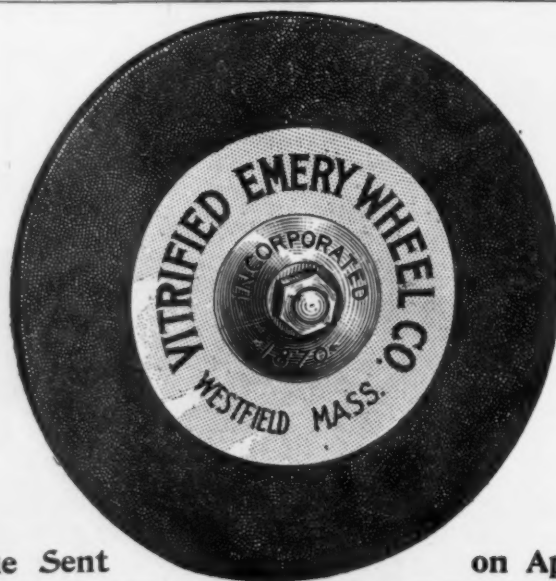
ROUGH DIAMONDS AND SAPPHIRES

For All Mechanical Purposes.
Diamond Bort, Carbon Splints, Flats and Powder.

Diamond Pointed Tools and Cutters.
MENDES CUTTING FACTORIES,
12, 14, 16 John St., New York.
Correspondence Solicited.



Manufactured by
THE STAR CORUNDUM WHEEL CO., Detroit, Mich.



Catalogue Sent

on Application.

THE SAFETY EMERY WHEEL CO.,

SPRINGFIELD, OHIO,

MANUFACTURERS OF

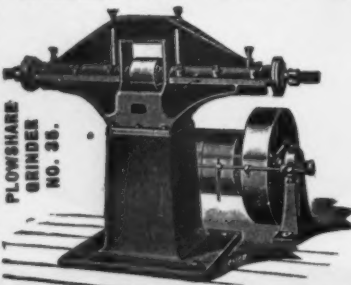
Emery Wheels

AND

Grinding Machinery.

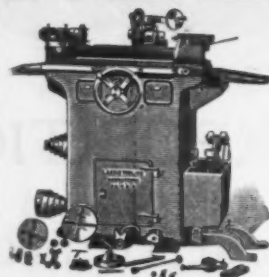
Pioneers of the only successful safety system of
using Emery Wheels.

SEND FOR CATALOGUE.



PLOWSHARE
GRINDER
NO. 35.

BUSINESS LOSSES



when realized, are made book records. A loss, perhaps, is not generally deemed a loss until it is apparent. We can show you how money is lost by sticking to lathes for finishing work which could be better done on **GRINDING MACHINES.** Read the little book we want to send you, and perhaps you will discover a long existing loss.

LANDIS TOOL CO., - Waynesboro, Pa. U. S. A.

THE RICHARD MANUFACTURING CO.,

Manufacturers of

DRAW BENCHES & SPECIAL MACHINERY

For Tubing and Sheet Metal.

— DIES A SPECIALTY. —
BLOOMSBURG, PENNA.

For Tool Grinding

For Saws & Knives

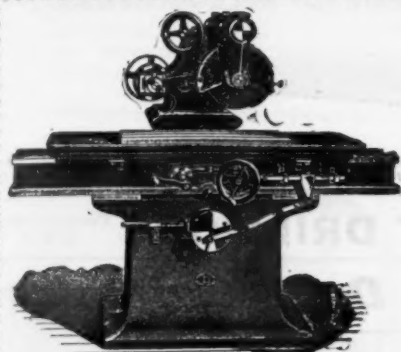
AMERICAN EMERY WHEELS

ARE THE STANDARD

For Foundry Use

For Wrought Iron & Steel

Manufactured by the AMERICAN EMERY WHEEL WORKS, Providence, R. I.



Surface Grinders.

These machines are very heavy and substantial. The work we put into them enables our customers to get work out of them. They are in use by Jewelers, Bolt and Nut Mfrs., Silversmiths, Drop Forge Works, and a large number of others. They all speak highly of the machine.

Write us and we will prove to you that our Surface Grinders are the best on the market.

Diamond Machine Co.,

Providence, R. I., and Chicago, Ill.

"Economy is Wealth." A little of your wealth invested in our Universal Grinding Machines will add to the economy of your output and increase your earnings.

UNIVERSAL MACHINE CO.,

Providence, R. I.

You can't gauge
The value
Of an
Abrasive Wheel
By its Life.

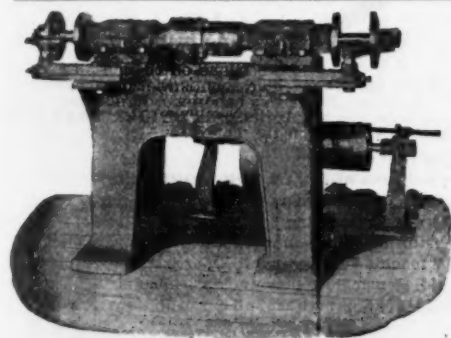
Long life is a good thing, but if a wheel lasts a year and does no more work than another wheel will do in a month, it is a mighty expensive grinding machine. It costs twelve times as much as it ought to in wages for the man who operates it.



not only does faster work than any other abrasive, but it does more work, better work — and in addition it lasts longer.
Big claims?

Will you let us prove them at our own risk?

The Carborundum Company,
Niagara Falls, N. Y.



Some Manufacturers

Want the *Cheapest*, others the *Best*. We make the *Best*, therefore the *Cheapest*.

2 in. Self-Oiling Emery Grinder.

This Grinder is all its name implies; Perfectly *Dust-Proof*, and fitted with *Oil Guards*. Will swing wheels 30 in. x 6 in. or smaller. Weighs complete 1150 lbs. We place them on their merits. We want your orders. Write us.

WEBSTER & PERKS TOOL CO., . . . Box 1240, Springfield, Ohio, U. S. A.

POLISHING STANDS.



I manufacture a full line of these Polishing Stands in all sizes; also . . .

SPINNING LATHES, AUTOMATIC STEAM
ENGINES AND SPECIAL MACHINERY.

DESCRIPTIVE PAMPHLET ON APPLICATION.

JOSIAH ROSS,

1443-1469 Niagara Street, Buffalo, N. Y.

My line of WOOD-WORKING MACHINERY is very complete and up to date, and is fully described in Catalogue "A."

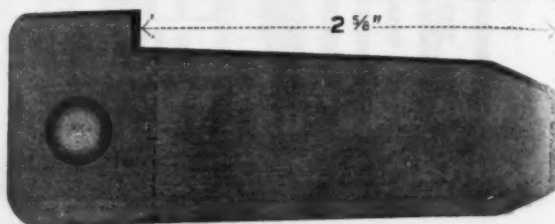
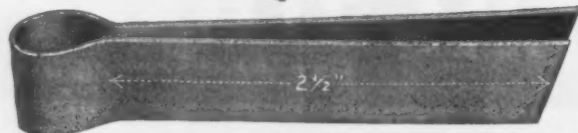
STANDARD SPRING SLOTTERS AND FLAT KEYS.

INFORMATION and PRICES
PROMPTLY on APPLICATION.The Standard Tool Co., 1266-68 Central Avenue,
CLEVELAND, OHIO, U. S.

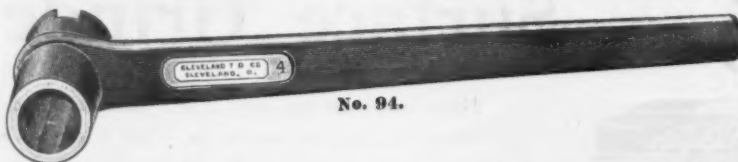
TRADE



MARK.



You want to drill a hole in a piece of metal already chucked in the lathe. What's the matter with this Drill Holder? It's just what you're looking for—can't it?



No. 94.

NEW YORK STORE, 99 Reade St.
FENWICK FRERES & CO., 21 Rue Martel, Paris.

CLEVELAND TWIST DRILL CO., Cleveland, Ohio,
U. S. A.

The WORCESTER Drill Grinders.

Pat'd
Oct. 1, '89.
Apr. 15, '90.
July 12, '98.
Others
Pending.



SIMPLE,
DURABLE
AND
EFFICIENT.

Cleveland, O., U. S. A., April 2, 1900.
The Washburn Shops of The Worcester Polytechnic
Institute, Worcester, Mass.
Gentlemen:—We take pleasure in saying that we have
used your Twist Drill Grinders here for many years and
have sold a large number of them. In our judgment they
are the best machine for grinding Twist Drills of which we
have any knowledge, and we have examined and experi-
mented with all the Twist Drill Grinders on the market at
the present time. We remain, yours very truly,
CLEVELAND TWIST DRILL CO.
By J. D. Cox, Jr.

Forged Steel Spindles.
Ground Tapered Journals.
Long Protected Bearings.
Everything First-class.



ADDRESS

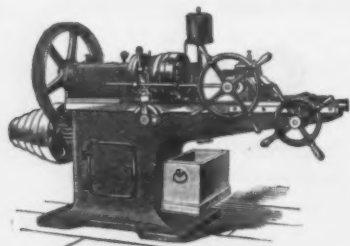
THE WASHBURN SHOPS,
POLYTECHNIC INSTITUTE,
Worcester, Mass., U. S. A.

**MODERN
FILE-CUTTING
MACHINERY.**

Single Machines or Com-
plete Outfits shipped to
any part of the world.

CORRESPONDENCE INVITED

Hess Machine Wks.,
25th and Callowhill Sts.,
PHILADELPHIA, U.S.A.



THE MORGAN BOLT CUTTERS

are unequalled for productive capacity and
durability. They combine the lightest action
with the greatest possible efficiency and
economy. It will pay you to investigate.
Eureka Rust Preventive makes machines
slightly and the polished parts brighter.
Holds firm and easy to clean. Write for
particulars.

THE RELIANCE MACHINE &
TOOL CO.,

33 W. CENTER ST., CLEVELAND, OHIO.

**The American
Drill Grinder.**

*The Time is
at Hand*

when one of the most essential
things in a modern machine shop is the correct grinding
of Twist Drills. We have a handsome, durable and accu-
rate machine which will grind drills BETTER THAN ANY
OTHER MACHINE on the market.

NOW! let us explain
WHY the "AMERICAN DRILL GRINDER"
SHOULD be shown a preference by
YOU when purchasing. If you
BUY this machine you will get one as simple as
ANY machine can be and work just right.
OTHER machines make unreasonable claims, but our
MACHINE proves that all our claims are true.

BUY NO EXPERIMENT!
but place your order for a machine that has stood the test
of time, and one that has proven satisfactory to all who
have used it.

IF YOU ARE INTERESTED and will send us your
address, we will in return send you our **NEW CATALOG**
which fully illustrates and explains many valuable fea-
tures of this machine, and indicates

**Why Our Machine should be shown a
Preference over all others.**

L. S. HEALD & SON,
Box 557, BARRE, MASS.

Sold by Chas. Churchill & Co., London. Montgomery &
Co., Paris. Garvin Machine Co., Berlin.



DURANT'S COUNTING MACHINES will keep an accurate
record of the amount
of work performed by your automatic machinery. **Corrects and prevents
Mistakes.** Counters received highest award at the World's Fair.

—SEND FOR CATALOGUE.—

W. N. DURANT, 283 Twenty-second Street, MILWAUKEE, WIS.

OUR Drills are Hot Forged, then ground to micrometer caliper gauge. By this process we make Drills which we



Our Twist Drill Sets
Make Attractive Dis-
play Window Goods.

SEND

FOR

CATA-

LOGUE.



Guarantee to be Accurate, Durable



and Highly Finished.

NEW PROCESS TWIST DRILL CO.,
TAUNTON, MASS., U. S. A.

JOHN H. GRAHAM & CO., Selling Agents, 113 Chambers Street, New York.

PITTSBURGH MFG. CO.,

BUILDERS OF



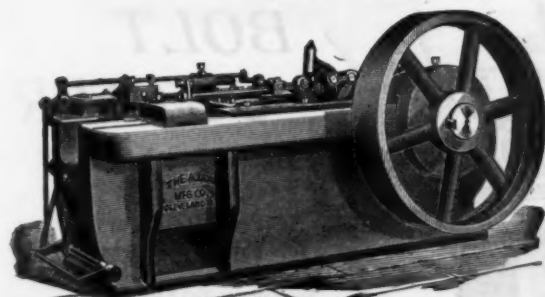
Crosgrave's Patent Straightening,
Bending and Punching Machines.

MANUFACTURERS OF

BOLTS, NUTS, RIVETS, CASTINGS, ETC.

Pittsburgh, Pa.

THE AJAX MANUFACTURING COMPANY,
CLEVELAND, O., U. S. A.



Sole Manufacturers of

The Blakeslee Improved

Belt Headers,
Rivet Headers,
Upsetting Machines,
General Forging Machines,
Hot Pressed Nut Machines,
Bulldozing and Bending Machines,
Forming Machines and
Special Nut and Bolt Machinery.

TOOLS AND SUPPLIES

For
Factories,
Mills, Mines,
Railways, Etc.

Files, Wrenches, Bolts, Hammers, Sledges, Vises, Chucks, Jacks, Punches, Steam Gauges, Valves,
Lathes, Hose, Packing, Pulleys, Shafting, Pipe and Fittings, Pumps, etc., etc.

SEND FOR
NEW CATALOGUE.

THE GENERAL SUPPLY COMPANY,
40 JOHN ST., NEW YORK.



**Full Automatic
Universal**

**Gear
Cutters.**

We make them first-
class every way for Spur,
Bevel, Worm and Inter-
nal gears.

We also cut Gears of all kinds
and sizes.

F. H. Bultman & Co.,
106 and 108 Canal St.,
Cleveland, Ohio, - - U. S. A.

IMPROVED ROTARY

Dial Power Press

MANUFACTURERS

CANNOT AFFORD

to use the old fashioned and primitive

Foot Press

when fifty per cent. can BE SAVED
by using our

Superior Grade of Presses.

THE CROSS & SPEIRS MACHINE CO.,
33 Canal St., Waterbury, Conn.

IRON PUTTY

Something new—A fine filler for Cast
Iron—Will not come out, shrink
or swell—Can be thinned
and brushed in.

MORGAN & WRIGHT
CHICAGO.

NAME

PLATES

For MACHINERY.

We make name plates for some of
the largest makers of machinery in the
U. S. and we would be pleased to send
you sample and quote price.

No Plate Too Large or Too Small.

MURDOCK PARLOR GRATE CO.,
154 Boylston St., Boston, Mass., U. S. A.

PILE DRIVERS,

Hammers, Nippers,
Sheaves, Liner Irons
Toggle Irons,
Pile Points
Pile Bands,

With or without woodwork, for
hand power, horse power or
steam power.

VULCAN IRON WORKS,
Milwaukee Ave., Chicago.



IRON WORKERS—WE GIVE A POSITIVE GUARANTEE THAT

The New Yankee Drill Grinder

Will make THE ENORMOUS SAVING OF OVER 50 PERCENT OF ALL THE TIME REQUIRED BY ANY OTHER DRILL GRINDER EVER PRODUCED, as the only preliminary adjustment necessary is to bring up the tail-stock to suit the length of the drill.

Every last gage jaw machine on the market requires not only the above adjustment, but cannot possibly grind a drill until they have first made all of the following additional adjustments or their full equivalents. Here they are:
Sliding sleeve is first loosened—Then moved away from wheel—The drill inserted—Gage jaws fitted to it—Sleeve clamped in that position—Drill removed—Drill holder loosened on bracket—Slid up to the wheel—Clamped in that position—And if by that time you have not forgotten where you are at, you are then ready to go on where we commence with our single adjustment of the tail stock. Can there be any argument as to which machine you want?

IF SO

Then set our machine by the side of any or all others, and make the ACTUAL TEST. Compute the money lost in workmen's wages for the life of such a machine (say 25 years). The first cost of a "NEW YANKEE" will have been eaten up a dozen times.

OTHER THINGS EQUALLY IMPORTANT

THE MOST SCIENTIFIC SHAPE to the point of the drill—therefore faster cutting and better work. Remember that we guarantee this feature.

THE ONLY VARIABLE CLEARANCE device extant, giving the same angle of clearance (much or little) to every size within the range of the machine without resetting. Why not grind your drills with just the right clearance for the work in hand, the same as you would any other tool?

THE ONLY DRILL RAISER for manipulating small drills to be found in any machine on the market. (Worth its weight in gold.)

CHEAPER HELP can understand and operate it. DRILLS very much easier to hold in the machine, and will not rotate under the fingers when the wheel strikes them. ALL STYLES—ALL SIZES, BELT OR ELECTRICALLY DRIVEN,

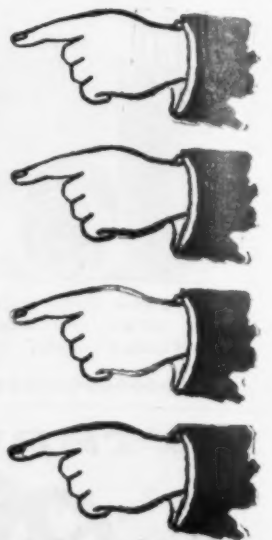
THE FULLER MFG. CO.,

Successors to G. T. EAMES CO.,

300 Michigan Avenue, KALAMAZOO, MICH., U. S. A.



Pat. in U. S. and Foreign Countries.



If you want gage jaw machines we are replacing them every day with "New Yankees" and would be glad to dispose of those taken in exchange at any old price. You don't have to buy new ones if you want them.

STOW FLEXIBLE SHAFT



Invented and
Manufactured by

THE
STOW MFG. CO.,

Established 1875

Binghamton,
N. Y.

PORTABLE.

DRILLING.
TAPPING,
REAVING

General European Agents,

SELIG SONNENTHAL & CO.,

Queen Victoria St.,

LONDON, ENGLAND.

PETER GERLACH & CO.,
CLEVELAND,

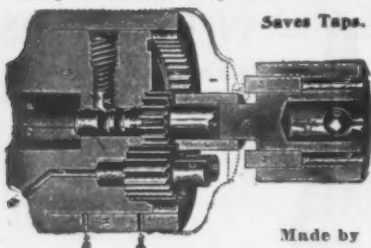
MANUFACTURERS OF

CIRCULAR SAWS,
ICE TOOLS,
LOGGING TOOLS,
KEG AND BARREL
MACHINERY.

THE IDEAL REVERSING TAP HOLDER.

Complete in Itself—Very Sensitive, and

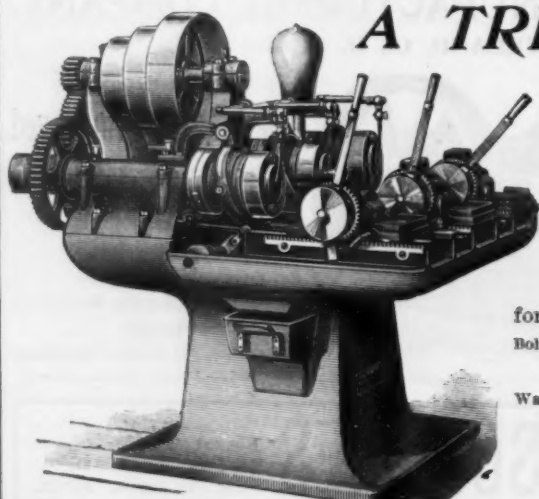
Saves Taps.



Made by

IDEAL MACHINE WORKS, - Hartford, Conn.

SEND FOR CIRCULAR.



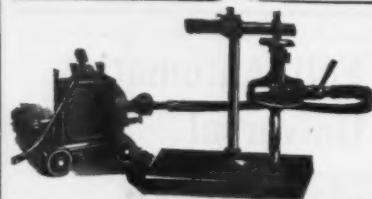
A TRIPLE BOLT CUTTER OF THE "NATIONAL" TYPE

is the perfection of machines
for this purpose. We make

Bolt Cutters, Pointers, Headers,
Nut Tappers, Nut Machines,
Upsetting and Binding Machinery,
Washer Machines, Wire Nail Machinery,
Hand and Automatic Spike Machines,
Car Link and Pin Machinery.

Complete Equipments
A Specialty.

THE NATIONAL MACHINERY CO., - Tiffin, O., U. S. A.



Recent in Development. Successful in Operation.
Our Flexible Shafts driven by our
Compressed Air Motor.

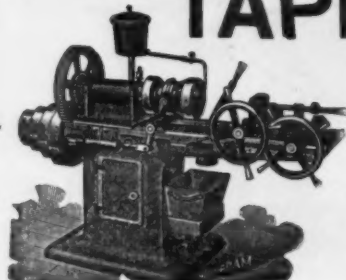
Light in weight. Mounted on wheels. Easily moved.
Cheap in price. Efficient in operation.
Write us for Catalogue 5.

STOW FLEXIBLE SHAFT CO.,
26th and Callowhill Sts., Philadelphia.
FREDERIC SCHOFF, PROPRIETOR

BOLT THREADERS HEADERS and NUT TAPPERS.

WRITE TO US FOR
ANY THING YOU
WANT IN THIS LINE.

EUROPEAN AGENTS.
Schuchardt & Schutte, Berlin
and Vienna.
Adphe. Janssens, Paris.
C. W. Burton, Griffiths & Co.,
London.



The Acme
Machinery Co.,
CLEVELAND, O.,
U. S. A.

Cor. St. Clair and Ham-
ilton Sts.

Morse Twist Drill and Machine Co.,

NEW BEDFORD, MASS., U. S. A.

WE MAKE A SPECIALTY OF

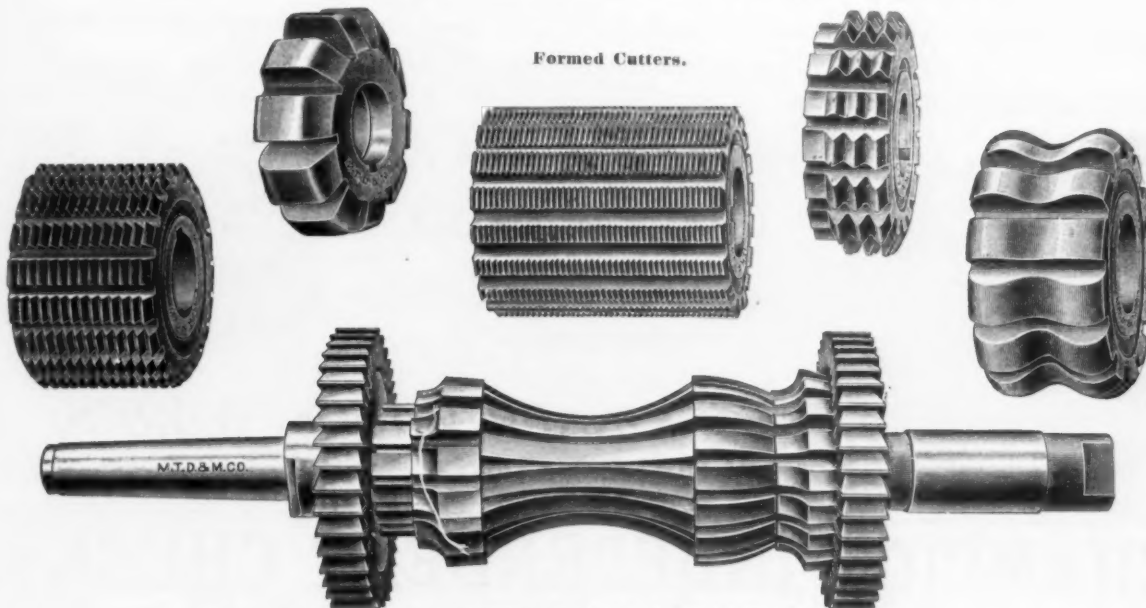
FORMED CUTTERS.

PRICES UPON APPLICATION.

LET US HEAR FROM YOU IF IN NEED.

Our New Catalogue will be ready about July 1st. Send us your name and address and we will forward you a copy as soon as issued.

Formed Cutters.



Gang of Formed Milling Cutters and Side Milling Cutters.

Whole Length of Gang 15 1/4 inches.

Diameter of Formed Milling Cutters 5 inches.

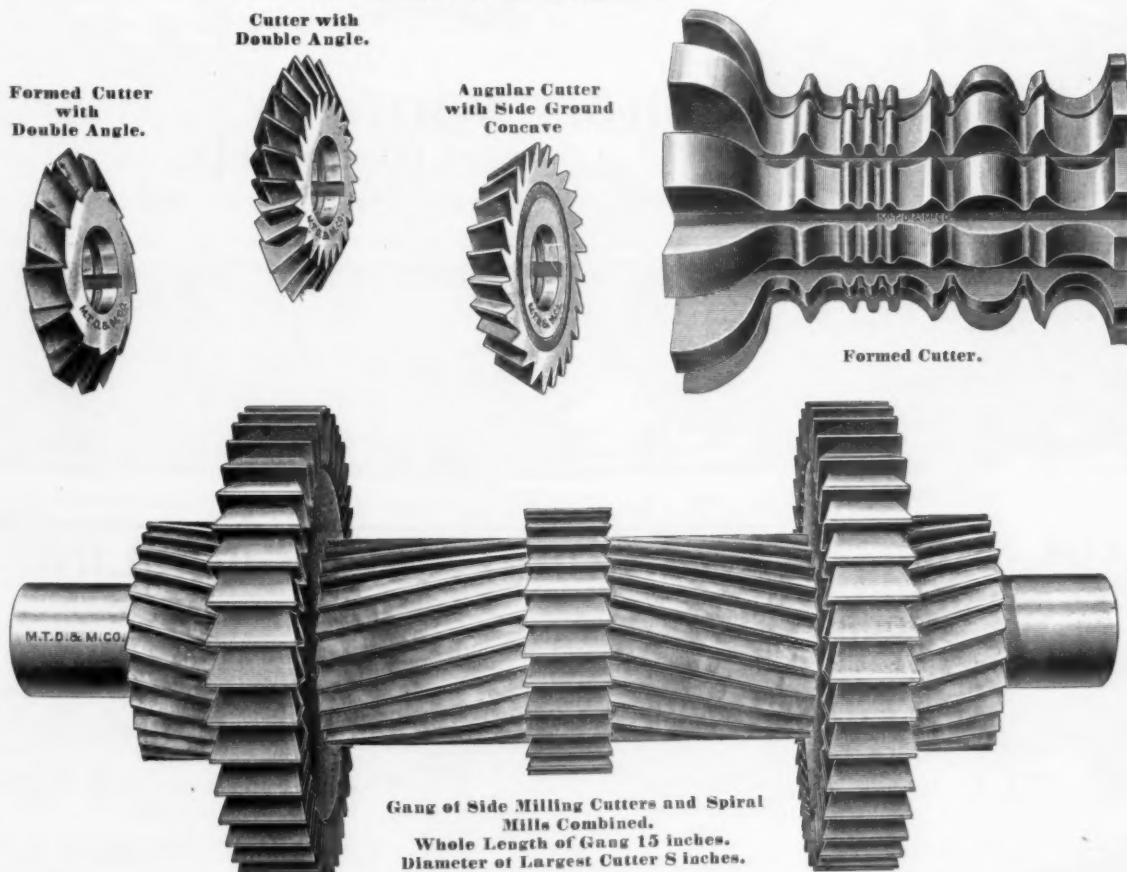
Diameter of Side Milling Cutters 8 inches.

Cutter with Double Angle.

Formed Cutter with Double Angle.

Angular Cutter with Side Ground Concave

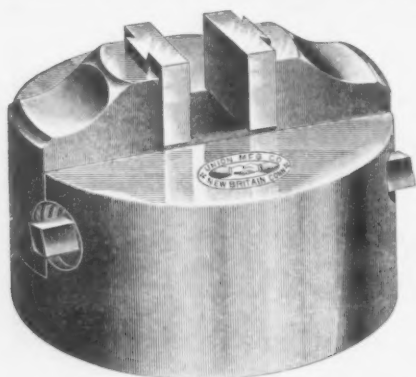
Formed Cutter.



Gang of Side Milling Cutters and Spiral Mills Combined.

Whole Length of Gang 15 inches.

Diameter of Largest Cutter 8 inches.



UNION 2 JAW CHUCK, NO. 40.

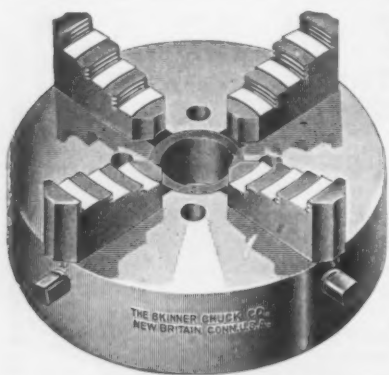
The operating screw is placed on the side, leaving an unobstructed hole in centre, permitting the passing of rods through chuck, without interference with screw.

Slip jaws of cast iron usually furnished, but can be made of steel at a slight additional cost if desired.

UNION MFG. CO., New Britain, Conn.,

Manufacturers of a full line of Independent, Combination, Universal, Geared, Scroll, Valve, Union and Czar Drill Chucks.

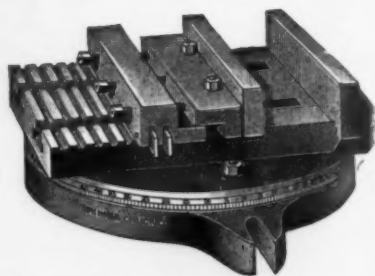
WAREHOUSE, 103 CHAMBERS STREET, N. Y.



SKINNER CHUCKS.

ACCURATE and DURABLE.

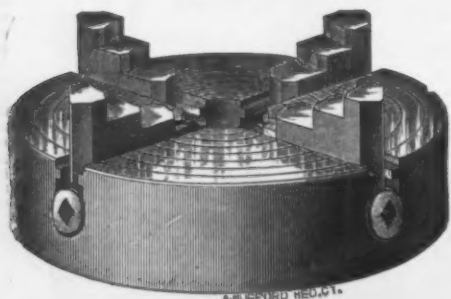
Send for 6 x 9 New Illustrated Catalogue.



**SKINNER CHUCK WORKS,
NEW BRITAIN, CONN.**

New York Office,
No. 94 Reade Street.

CHAMPION INDEPENDENT CHUCKS.



An entirely new line of small Chucks, provided with 3 or 4 independent reversible steel jaws. The best Chuck in the market for foot lathes. Ask your dealer for them or write to us.

**THE D. E. WHITON MACHINE CO.,
NEW LONDON, CONN.**

European Agents, SELIG SONNENTHAL & CO., 85 Queen Victoria St., LONDON.



PLACING DIES IN HEAD.

ACCURATE HEAD-WORK
Perfect Screw Threads
PEERLESS AND DUPLEX
Adjustable Dies
Quickly Released.
(HAS MURCHILL & CO. LTD. LONDON.
DE FRIES & CO. DUSSELDORF.
AKTIEBOLAGET VERKTYGSMASKINER
STOCKHOLM.)

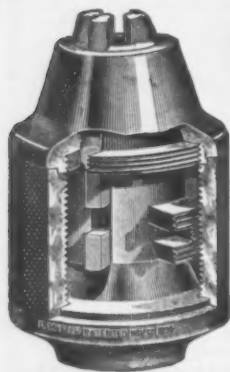


DIES CLOSED FOR THREADING.

ALWAYS WINS
Made by The **DIE-HEAD** on
PIPE THREADING MACHINES
No Crooked Threads
Pipe Screw Ends True to Dies
Makers, **THE BIGNALL & KEELER MFG. CO.**
EDWARDSVILLE, ILL. U.S.A.



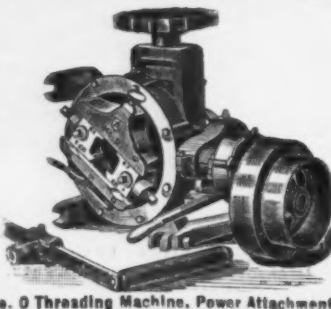
DIES RELEASED.



**THE
WEIR
"MODEL"
DRILL
CHUCK**

Powerful Grip,
Perfectly True.
Send for Catalogue.
DOEBLER MFG. CO.
Middletown, Conn.

WE BUILD A SUPERIOR LINE



of **PIPE THREADING**
and **CUTTING-OFF**
MACHINES, (Hand or Power,)
STOCKS, DIES and other Tools
For
WATER, STEAM and GAS FITTERS.
— CATALOGUE ? —

THE ARMSTRONG MFG. CO.,

No. 0 Threading Machine, Power Attachment.

139 Centre St., New York.

BRIDGEPORT, CONN.

WHEN YOU BUY CARD TAPS AND DIES

You get The Best at a Reasonable Price.

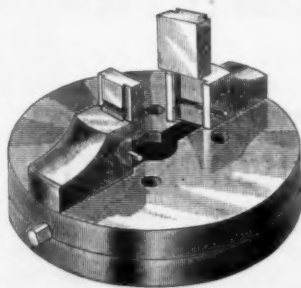


Why Not Try Them?

S. W. CARD MFG. CO.,

Send for our Catalog.

Mansfield, Mass., U. S. A.



Universal Chucks,
Independent Chucks,
Combination Chucks,
Drill Chucks,
Chucks for Lathes,

Chucks for Milling Machines,
Chucks for Cutting-Off Machines,
Chucks for Upright Drills,
Chucks for Car Wheel Borers,
Chucks with 2 Jaws. Chucks with 3 Jaws,
Chucks with 4 Jaws, Chucks with 6 Jaws,
Chucks for all Purposes.

SEND FOR CATALOGUE.

E. HORTON & SON CO.,

Windsor Locks, Conn., U. S. A.

SCHUCHARDT & SCHUTTE, Berlin, Vienna, Cologne, Stockholm and New York.
FENWICK FRERES & Co., Paris, France.

DON'T
ASK
US.

LET THE
CUTS
SPEAK.

Examine the
shanks, and
decide which
pays and
which loses
money.



Drills held
by a

PRATT CHUCK

cannot slip.

SEE FREE
BOOKLET.



Pratt Chuck Co.,
Frankfort, N.Y., U.S.A.

EVERY
DESCRIPTION
OF

Wood - Working
Machinery.

ILLUSTRATED POSTER FREE.

J. A.
FAY

288 to 308 W. FRONT ST.,
CINCINNATI, O

& CO.

We Welcome

Correspondence.

RAWHIDE GEARS

MANUFACTURED BY

Morsburgh & Scott,
CLEVELAND, OHIO.



HAVE YOU EVER SEEN THIS CASE BEFORE?

ALMOST EVERY HARDWARE DEALER HAS ONE.

They are WELLS BROS. & Co.'s TAP AND DIE CASES.

These are arranged for keeping conveniently and systematically a complete stock of Bicycle Split Dies $\frac{1}{8}$ and $\frac{1}{4}$ inch diameter, with Taps to match, the draws having tills for different sizes.

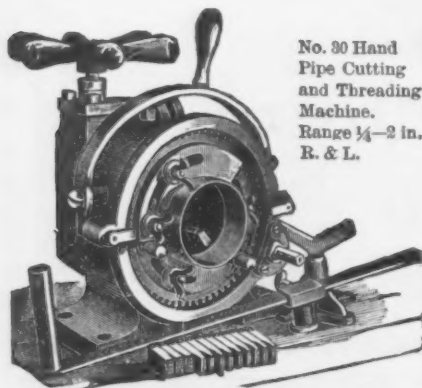
If you are not handling "LITTLE GIANT" tools, write us how to get one of these cases.



We also have a large case arranged for holding Machinists' Hand, Machine Nut, and Machine Screw Taps, Adjustable Dies, Countersinks, Reamers, etc. This case has 28 drawers.

WELLS BROS. & CO., - - GREENFIELD, MASS.

SCREW CUTTING TOOLS AND MACHINERY SEND FOR CATALOGUE "C."



No. 30 Hand
Pipe Cutting
and Threading
Machine.
Range $\frac{1}{4}$ -2 in.
R. & L.

Curtis & Curtis

No. 15 Garden St., BRIDGEPORT, CONN.

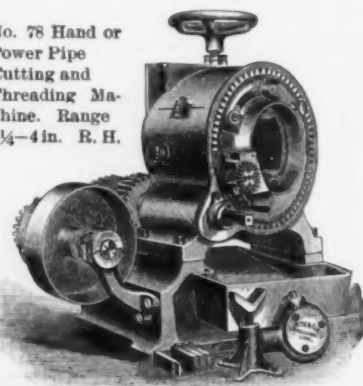
MANUFACTURERS OF

FORBES' PATENT DIE STOCK, FOR HAND OR POWER.

OUR HAND MACHINES are the only portable hand machines in the market with which one man can cut off and thread large pipe up to 12 inches diameter without assistance. Two and three-inch pipe is threaded by using only one hand on the crank, thus saving much time and hard labor.

OUR POWER MACHINES occupy less floor space, require less power to run them, are more simple of construction, and are far cheaper than any other make of machine of the same range in the market.

No. 78 Hand or
Power Pipe
Cutting and
Threading Ma-
chine. Range
 $2\frac{1}{4}$ -4 in. R. H.



RATCHET DRILLS, RATCHET DIE STOCKS, MALLEABLE IRON PIPE VISES.

SEND FOR ILLUSTRATED CATALOGUE.

FOR CUTTING SHEET METALS.



Strong and
simple in
construc-
tion.
Moderate in
price.

Compound Lever and Pinion GAP SHEAR.

Send for Circular and Price.

C. S. MERSICK & CO.,
New Haven, Conn.



10-in. Bench Drill.

Takes 0 to 5-16 in. Drills.

1,000 in use giving good account of them-
selves. Better on light work than larger tool.
Others—1 to 4 spindle.

Telegraph, Telephone, write or come and
see us.

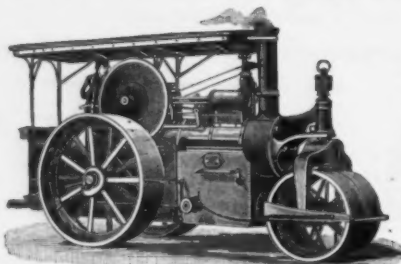
D'AMOUR & LITLEDAL MCH. CO.,
131 Worth St., New York.

Foreign Agents:

LONDON, C. W. BURTON, GRIFFITHS & CO.
BERLIN, } SCHUCHARDT { COLOGNE,
BRUSSELS, } & { ST. PETERSBURG,
VIENNA, } SCHUTTE. { STOCKHOLM.

THE O. S. KELLY COMPANY,

Springfield, Ohio, U. S. A.



Steam Road Rollers,
Steam Asphalt Rollers,
Overland Freighting Outfits,
Paper Mill Machinery.

Catalogue Free on Application.

D. SAUNDERS' SONS

MANUFACTURERS OF PATENT



PIPE CUTTERS

in three styles. **One Wheel and Roller Cutter.** **Three Wheeled Cutter** and the **Tool Cutter**, for cutting **Brass, Copper** and **Wrought Iron Tubes.** Also mfrs. of **Pipe Cutting** and **Threading Machines** $\frac{1}{4}$ in. to 18 in., **Hand** or **Power.**

Send for Catalogue to **27 ATHERTON ST., YONKERS, N. Y.**

HYDRAULIC JACKS.

PRESSES, PUMPS, ACCUMULATORS, VALVES, GAUGES and FITTINGS, HAND, HYDRAULIC and POWER PUNCHES and SHEARS.

THE WATSON-STILLMAN CO.,
204-210 E. 43d St., New York.

CHICAGO BRANCH: 453 Rookery.
CHAR. G. ECKSTEIN, Spandauer Str., 16-17, Berlin, C., Germany.

Send for
Catalogue R.

RICHARD DUDGEON,

No. 24 Columbia St., New York.

Maker and Patentee of the Improved

Hydraulic Jacks AND Punches.

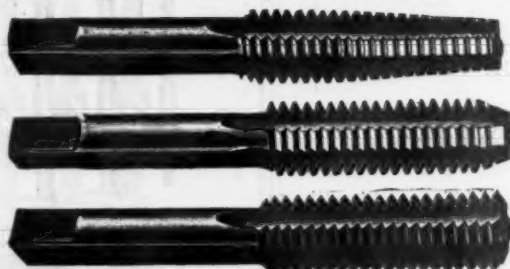
**Roller Tube Expanders
and Direct Acting
Steam Hammers.**

Jacks for pressing
on Car Wheels or
Crank Pins made to
order.

Communication by
letter will receive
prompt attention.

FINEST QUALITY HAND TAPS.

Also a general
line of
**Screw Plates,
Taps, Dies,
&c.**
Send for cata-
logue and
prices.



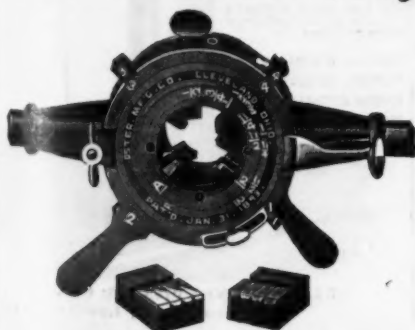
In all threads
and sizes for
**BICYCLE,
ELECTRICAL,
and
MACHINISTS'
WORK.**

THE E. F. REECE CO., Manufacturers, GREENFIELD, MASS.

Chicago Office: 154 Lake St.

New York Office: 127 Duane St.

The Oster Adjustable Stock



will do your work as accurately
as a power machine; it is very
light and easily handled. Every
tool is perfect and guaranteed to
cut the thread with a single oper-
ation.

THE OSTER MANUFACTURING COMPANY,
Cleveland, Ohio, U. S. A.

AGENTS:
Chas. Churchill & Co., Ltd., London.
Delisle & Ziegele, Stuttgart, Germany.
V. Lowener, Copenhagen, Denmark.
The Fairbanks Co., New York City.

RELIANCE HYDRAULIC JACKS.

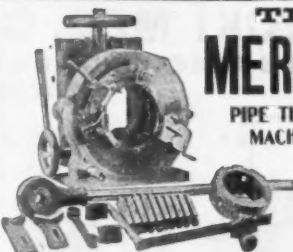
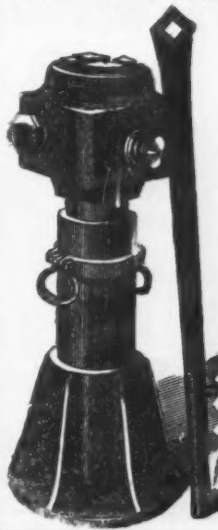
**Superior to any Jack
now made.**

**Absolute in its
actions in any posi-
tion.**

**Under complete
and instantaneous
control.**

**Made in Four Sizes,
10, 15, 20 and 30
ton capacity, to lift
12 or 18 inches.
Broad Base or
Ground Lift.**

**Blenett &
Eisenhardt,
MAKERS,
1308 Howard Street,
PHILADELPHIA.**



THE MERRELL PIPE THREADING MACHINERY.

We make the best and most com-
plete line in the world, strength,
durability and efficiency con-
sidered. Send for catalogue.

THE MERRELL MFG. CO.

TOLEDO, O.

London, H. Munzinger. Bremen, August Eggers. Brus-
sels, A. Hennuy. Lucerne, Franz L. Meyer. Chris-
tiania, C. S. Christensen. Paris, L. Masson & Co.
Vienna, White, Child & Beney. Dresden, Robert
Grimshaw.

Bicycle Taper Taps.

**BUTTERFIELD & CO., DERBY LINE, VT.
ROCK ISLAND, CAN.**

"Cushman" Chucks

We manufacture Ten distinct styles of Lathe Chucks,
Four styles of Drill Chucks, Centering Chucks, Face
Plate Jaws and Chucks for special service.
Send for new catalogue and discount sheet.

The Cushman Chuck Co.,
Hartford, Conn., U. S. A.

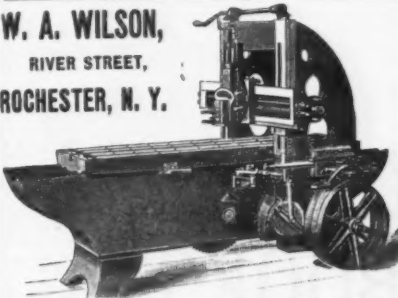
Geared Scroll Chucks.

We make the only solid reversible jawed
scroll chuck on the market. No extra set of jaws
to monkey with. We make other chucks, too.
Send for our catalogue and discount sheet.

THE HOGGSON & PETTIS MFG. CO.,
New Haven, Conn., U. S. A.

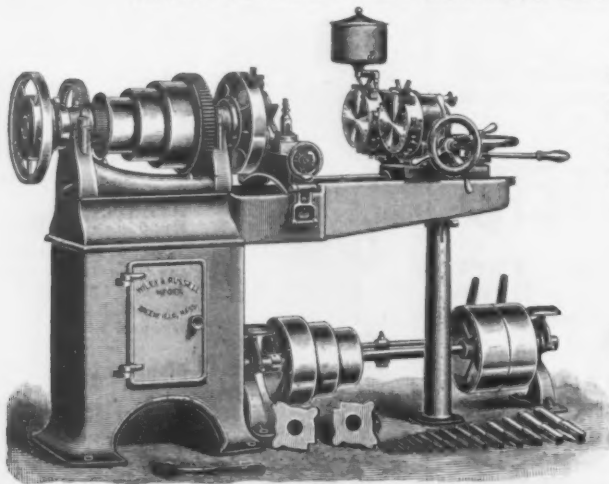
W. A. WILSON,

RIVER STREET,
ROCHESTER, N. Y.



Improved Iron Planers a specialty, 20 x 20, 22 x 22,
24 x 24 up to 42 x 42, to plane any length. Send for de-
scription and price list before purchasing. Special
machinery built to order. Mention Iron Age.

**Superior Bolt-Cutting and Nut-Tapping Machines, with
OPENING DIES and CUTTING-OFF ATTACHMENT.**



Our Nos. 55 and 50
Machines will thread
bolts, nuts and pipe,
and cut off bars and
pipe.

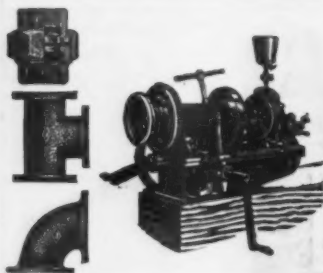
Send for Catalogue.

**Wiley & Russell Mfg.
Co.,**
Greenfield, Mass.,
U. S. A.

JARECKI MFG. CO., - - ERIE, PA.
PIPE THREADING AND CUTTING TOOLS OF ALL
DESCRIPTIONS.



Malleable and Cast Iron
Fittings.
Brass and Iron Body Valves
and Cocks.
Pipe Threading Tools.



Write for Catalogue showing the most complete line
of 1/4-inch to 16-inch for hand, belt, engine and with
electric motor attachment
We can furnish Bolt Threading Attachment for this
Machine.

**YOU PROBABLY
KNOW**

WILLIAMS

that a poor steel cannot be used in
a drop-forging. It stands to reason
that nothing but a good quality steel
will stand the terrific hammering
given it in the drop-forging process.
And a good steel becomes all the
better for the pounding. It is more
compact. More solid. There is no
chance for a blow-hole or any of the
flaws common to castings. Where
great strength is desired, combined
with lightness, nothing touches the
spot like the drop-forging. Add to
strength and lightness guaranteed
quality, and you have a Williams
Drop-Forging, of which accuracy
and close-to-sizes are features. If
you need parts of good machinery,
tools, engines, motors, pumps, auto-
mobiles, etc., we will make them
for you to special order. We've had
the necessary experience.

**DROP-
FORGINGS**

J. H. WILLIAMS & CO.,

9-31 Richards St., Brooklyn, New York.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest
work on any subject in which you are inter-
ested by addressing **DAVID WILLIAMS**
COMPANY, Publishers and Booksellers, 232-238 William St., N. Y.

BOWEN OIL CUPS

Styles "B," "C" and "D," are
self-closing, dust-proof, easily at-
tached to any machine with ordi-
nary wrench, because they have
hexagon shoulder, cannot
jar loose or open and have
no caps to be taken off or
lost. They are well and
strongly made and will stand
the test of time Better than other
makes, because of the points named
above, but no higher in price than
Oil Cups used for similar purposes.



D-1

Used extensively on Ma-
chinery, Motors, Dyna-
mos, Automobiles, Ele-
vators, etc., where abso-
lutely dust-proof cups
are necessary.

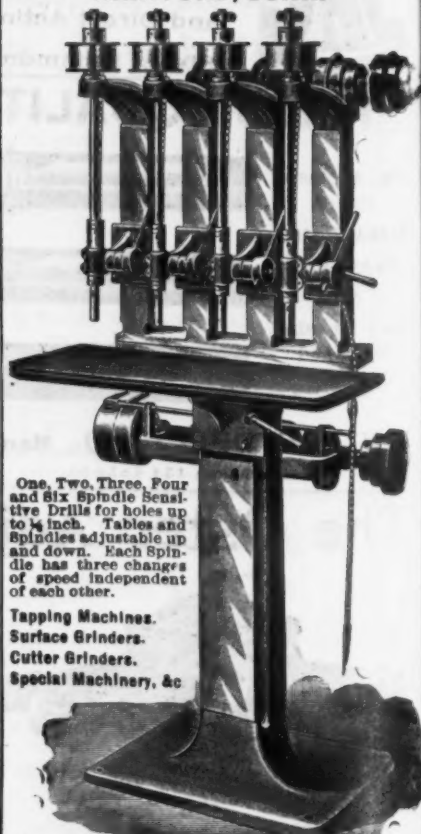


Styles "G" and "M"
"4-B" are a cheap oiler to be
driven in. While these may be
threaded, they are best used with-
out thread. In this case they are
tapered slightly to insure tight fit.

These oilers are made in different
sizes to suit the demands. Pipe
threads are furnished where de-
sired and the cups are furnished
plated or not as wanted.

BOWEN MFG. CO.,
AUBURN, N. Y.

Woodward & Rogers,
HARTFORD, CONN.

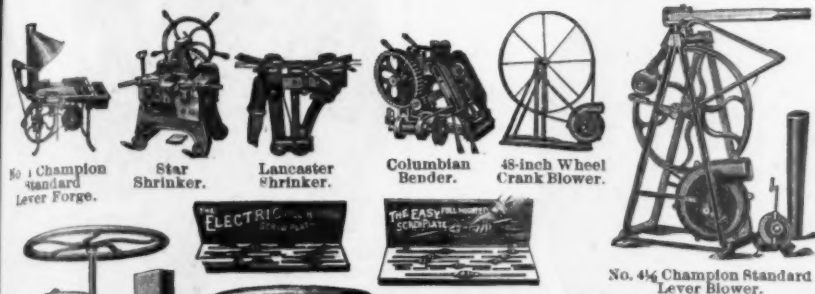


One, Two, Three, Four
and Six Spindle Sensi-
tive Drills for holes up
to 1/4 inch. Tables and
Spindles adjustable up
and down. Each Spin-
dle has three changes
of speed independent
of each other.

Tapping Machines.
Surface Grinders.
Cutter Grinders.
Special Machinery, &c

SELIG, SONNENTHAL & CO.,
European Agts., London, Eng.

Champion Blower & Forge Co., Lancaster, Pa.



No. 1 Champion Standard Lever Forge. Star Shrinker. Lancaster Shrinker. Columbian Bender. 48-inch Wheel Crank Blower.

No. 4 1/4 Champion Standard Lever Blower.

Drills, all sizes and prices. Lever and Crank Blowers and Forges, all sizes, styles and prices. Star Shrinker and Welder in 3 sizes. Screwplates 1/8 to 1/2 inch in size. Improved Tire Benders, all sizes.

All Standard Champion Blowers and Forges are fitted with the Champion Brass Ball-joint Oscillating Journal Bearings, requiring oiling but once in 6 months.

Write for our 1900 192-page catalogue illustrating the largest and most complete line of this class of goods manufactured under one management in the world.

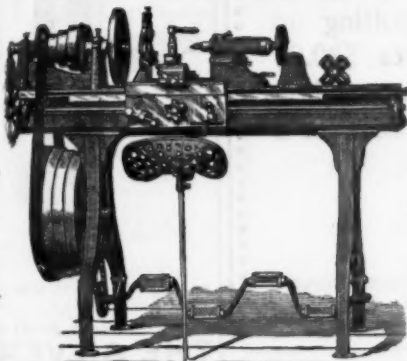
Champion Blower & Forge Co.
Lancaster, Pa., U. S. A.

FOOT POWER LATHES

Built for Experimental and Electrical Work.

Cycle Repair and General Machine Shop Work.

Tool Makers and Gunsmiths.



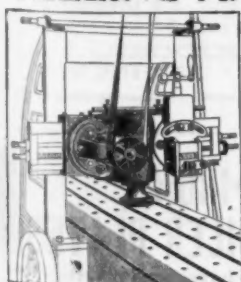
Lathes furnished with Stand-up Treadle or Countershaft if preferred.

Our Screw-Cutting Lathes have a hollow spindle; set-over tail stock; tool carriage adapted for taper-boring and turning. Workmanship and material are of the very best. Our lathes are strong and practical tools and built for business.

Send for Catalogue and Prices.

W. F. AND JOHN BARNES CO.,
69 RUBY ST., ROCKFORD, ILL.

MILLING MACHINE



Combined with any **IRON PLANER**

Swivels from horizontal to vertical. Do not plane surfaces that should be milled, or mill surfaces that should be planed.

SEND FOR CATALOGUE.

The Adams Company, Dubuque, Iowa.

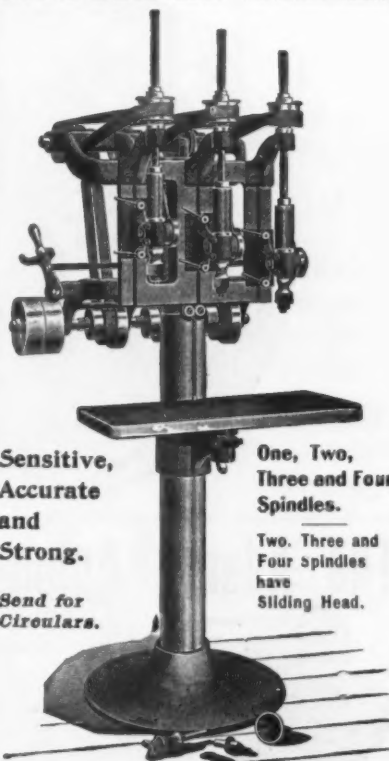
MOLDING MACHINES.



Send for

Catalogue.

SIGOURNEY DRILLS



Sensitive, Accurate and Strong.

Send for Circulars.

One, Two, Three and Four Spindles.

Two, Three and Four Spindles have Sliding Head.

ENLARGED FACILITIES

and EQUIPMENT now enable us to fill orders promptly. Also to offer INVENTORS, ENGINEERS and those having inventions or improvements in machines or appliances our mechanical skill and experience in bringing them to commercial success. Contract or day work. Highest standard of workmanship.

THE SIGOURNEY TOOL CO., Hartford, Conn., U. S. A.

We manufacture a complete line of

DRILLS

for light work, one or more spindles, hand or automatic feed, of thorough workmanship and strictly up to date.

PROMPT DELIVERY ON REGULAR STYLES.

New Catalogue on application.

Owight Slate Machine Co.,
HARTFORD, CONN.



New 20-inch Drill

With Back Gears, Self-Feed, Quick Return, Automatic Stop, Graduated Quill and Reverse Motion.

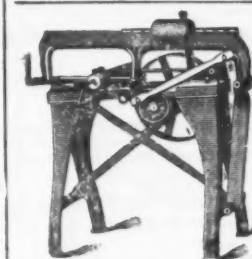
Our Drill Book shows the many qualities of this machine.

SIBLEY & WARE,

150 E. Tutt St.,

SOUTH BEND, IND.

New York Agents for Export—MARKT & CO., Ltd., 193 West St.



Drill Presses, Bicycle Machinery, Power Hack Saws, Saw Blades and Drill Chucks, Furniture Spring Machinery.

Special Iron, Wire and Wood Working Machinery Designed and Built to Order.

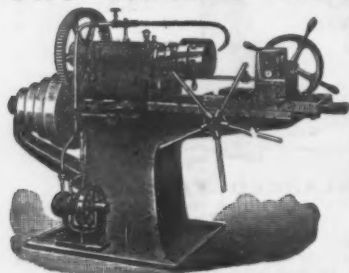
MANUFACTURED BY

HOEFER MFG. CO., Freeport, Ill., U. S. A.
(Successors to STOVER NOVELTY WORKS.)

Foreign Agents: Schuchardt & Schutte, Berlin, Cologne, Vienna, Brussels and Stockholm. C. W. Burton, Griffiths & Co., London. A. Hummel Fils, Chaux-de-Fonds, Switzerland.



The Adams Automatic Bolt Threaders,



Single, Double and Triple Heads.
Sizes, Bicycle Spokes to 4-inch Rods.

The simplest, strongest and most reliable head made. Heads furnished fitted for any other make of machine. Nut Tappers, Bolt Pointers, Nut Facers, etc.

Catalogues and Prices Furnished on Application.

The DETRICK & HARVEY MACHINE CO., Baltimore, Md

Manufacturers of THE OPEN SIDE PLANER.

WAS paying others \$18.00 per ton for cutting up wire. Now our customer, and saves \$90.00 per day by cutting up his own; using five tons per day. We can show you the same saving. Look for a letter. If you don't get it, write us.

THE F. B. SHUSTER CO.,

Formerly JOHN ADT & SON,

MILL STREET, - - - - - NEW HAVEN, CONN.

LATHES,

ISRAEL H. JOHNSON, JR., & CO., - PHILADELPHIA.

**Lathes.
Punches.
and
Shears.**

Send for Circulars.

W. C. Young Mfg. Co.,

17 HERMON ST.,

Worcester, Mass., U. S. A.

Telegraph Address: YOUNG WORCESTER.

Western Union Code.

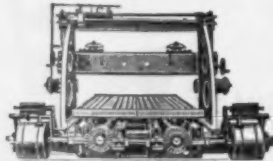
STONE CUTTING AND SAWING MACHINERY

J. Gilmour's Patent.

Saw Dogs, Shaftings, Planers, Rubbing Beds, Hoisting Machines, both Steam and Belt Power, Cranes, Diamond Saws, Derricks, Block Cars, Tile Machinery.

J. GILMOUR, MANUFACTURERS' AGENT,
Bennett Building, Nassau and Fulton Sts., New York.

Telephone 4090 Cortlandt.



**MACHINES FOR
Stone AND Marble Working.**

F. R. PATCH MFG. CO.,

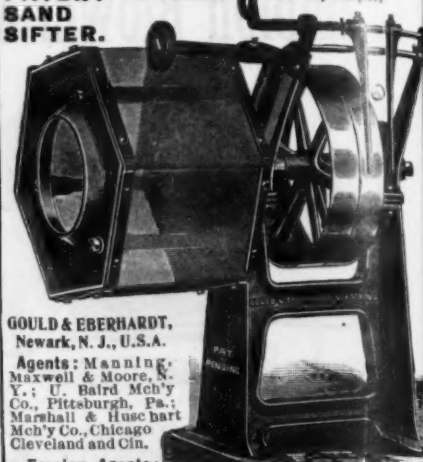
Rutland, Vt., U. S. A.

New Circular Planer.

Send for Catalogue.

PATENT SAND SIFTER.

A Profitable Foundry Helper.



GOULD & EBERHARDT,
Newark, N. J., U.S.A.

Agents: Manning,
Maxwell & Moore, N.
Y.; U. Baird Mch'y
Co., Pittsburgh, Pa.;
Marshall & Husbart
Mch'y Co., Chicago
Cleveland and Cin.

Foreign Agents:
Schuchardt & Schutte, Berlin, Cologne, Vienna, Brus-
sels, Stockholm, St. Petersburg; John Lang & Son,
Johnstone, Scotland, and England; Roux, Freres & Co.,
Paris, France; Selig, Sonenthal & Co., London; White,
Child & Beuey, Vienna.

DRILLS to DRILL HOLES \$6.00 to \$85.00.



3 sizes.
"Advance" Drills,
Nos. 12, 13 and 14.
Hand or Power.

4 sizes,
Silver's Drills,
Nos. 1 1/2, 1, 2 and 3,
for hand use.

19-inch Power
Post Drill, has
Cut Gears and is
Well Made.

20-inch Base Drill,
Round or Square
Base.

Lever or Screw Feed.

FOR USE IN

Blacksmith Shops,
Wagon Shops,
Bicycle Repair Shops,
Factories doing
Light Work, &c.

SILVER'S DRILL
No. 1 1/2, Weight, 55 lbs.
Price, \$6.00.

Every Drill Guaranteed.

THE SILVER MFG. CO.

317 Broadway, Salem, Ohio.

Do you want the best

DRAWING TABLE



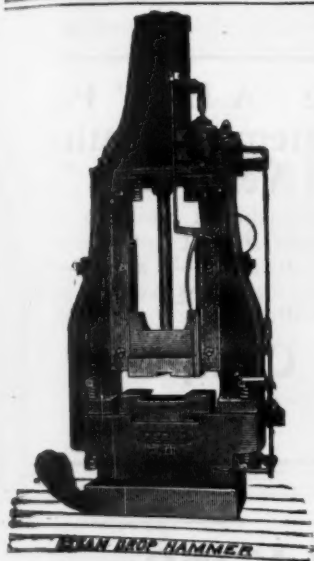
made? If so send for illustrated
catalogue and prices.

R. H. KIDDER,
33 HERMON ST., - WORCESTER, MASS.

CHARCOAL-IRON BOILER PLATES.

The same as we have been making for
the last thirty years.

THE SEIDEL & HASTINGS CO.
Wilmington, Delaware.



BEMENT, MILES & CO.

PHILADELPHIA, PA.

MANUFACTURERS OF

METAL WORKING MACHINE TOOLS

FOR

Railroad Shops, Locomotive and Car Builders, Machine Shops, Rolling Mills, Steam Forges, Ship Yards, Boiler Shops, Bridge Works, etc., etc.

Steam Hammers, Steam Drop Hammers, Steam and Hydraulic Riveting Machines.

NEW YORK OFFICE, 136-138 Liberty St.
Chicago Office, 1534 Marquette Bldg.

WE MAKE LARGE BALLS

for the bearings of heavy machinery. We make them with the greatest possible accuracy, from the best materials procurable, and by methods of our own which produce balls of perfectly uniform quality. Write for prices.

Ask for List No. 7.

We Manufacture Special Machinery Tools. Write us.

Cleveland Ball & Screw Co., 448 ARCADE, CLEVELAND, O.

The Colburn Keyway Cutter

Built in five sizes. Work chucked by its bore. Keyways can be cut either straight or taper. The greatest Labor Saving Machine Tool on the market. Send for illustrated Catalogue "G." It is full of useful information.

BAKER BROS.,

TOLEDO, O., U. S. A.

Or Our Agents:

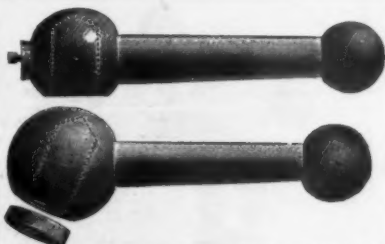
Manning, Maxwell & Moore, New York; Hill, Clarke & Co., Boston and Chicago; Chas. Churchill & Co., London; Birmingham and Glasgow; Schuchardt & Schütte, Berlin; Brussels, Vienna, Stockholm and St. Petersburg; Adolph Janssens, Paris.

This Machine can be seen in operation at Paris Exposition, Vincennes, Space 4, Block 18.



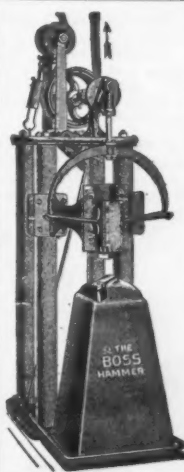
STEEL BALL MACHINE CRANK HANDLES.

Turned from solid steel, manufactured with key ways or ready for tapping, and in any special sizes or shapes. Three styles of stock handles are made, two of which are shown. The first is an ordinary two-ball lever, ready for tapping, fitted with set collar. The second is a handle adapted for tail stock centre tightener on lathes. Write



Designers and Builders special tools, machinery and forgings and screw machine specialties.

THE NORWOOD BICYCLE CO.,
Cincinnati, O.



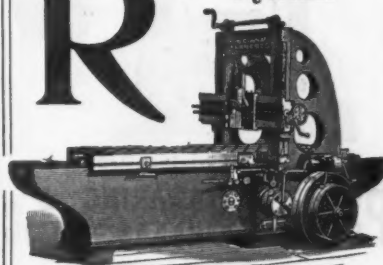
"BOSS" HAMMER.

High Grade,
Low Price.

**MADE IN
DUBUQUE.**

G. E. DAVIS,
DUBUQUE
MACHINE CONCERN,
DUBUQUE,
IOWA.

PLANE- 30-33-36 IN. SQUARE.



Patent Combination Friction,
New Feeding Device,
Crucible Steel Shafts,
Powerful Gearing,
etc.

**THE CINCINNATI
PLANNER CO.,**
Cincinnati, O.
U. S. A.

Cable Address:
Planner-Cincinnati.

AGENTS: Prentiss Tool & Supply Co., New York, and Buffalo; Marshall & Hueschart Machinery Co., Chicago, Cleveland and Cincinnati; The Niles Tool Works Co., Boston; Wm. E. Shipley, source, Philadelphia; Monongahela Machine Tool Co., Pittsburgh; Defries & Co., Act.-Ges., Dusseldorf, Berlin and Vienna; C. W. Burton, Griffiths & Co., London; V. Lowener, Copenhagen and Stockholm; Adler & Eiseusnitz, Milan, Italy.

**THE
Keagy & Lear
Machine Co.,**
COSHOCTON, O.

Manufacturers of Miners' Drilling Machines, Needles, Tampers and Scrapers, Wedges and Sledges; also Post Hole Augers, Steel Fence Posts, Wire Picket Fence. We can quote you prices that will interest you. Write.

BICKNELL'S IMPROVED SHEAR

No. 1 cuts iron 8 x 3/4.

Price, \$10.00.

No. 2 cuts iron 4 x 1/4.

Price, \$15.00.

All castings drilled and each shear thoroughly tested before shipping.

Write for prices on combined and separate punches and shears, emery grinders, tire removers and boiler pumps.

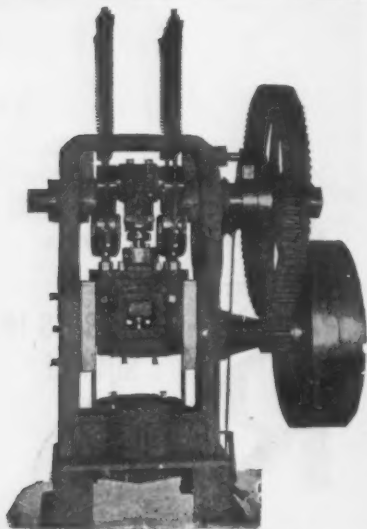
The Bicknell Hardware Co.,
Janesville, Wis.





We Manufacture
Blowers, Exhausters, Heat-
ers, Engines, Heating, Ven-
tilating and Drying Appa-
ratus, Mechanical Draft,
Dry Kilns, etc. Correspond-
ence solicited.

NEW YORK BLOWER CO.
Bucyrus, O., U. S. A.
New York Office, 39 and 41
Cortlandt St., New York.

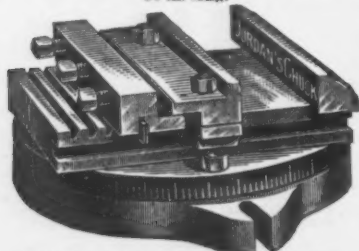


No. 4 Drawing Press.

POWER SQUARING & C.
PRESSES, SHEARS,

PHILADELPHIA MACHINE TOOL CO.,
445-449 North Darien St.,
PHILADELPHIA.

PLANNER CHUCKS
ROUND AND SQUARE BASE.
Jaws 6 in., 8 in., 10 in., 12 in., 15 in., 18 in., 24 in.
90 in. long.



THE GEO. BURNHAM CO.,
15 Hermon Street, Worcester, Mass.

HUGH L. THOMPSON,

Waterbury, Conn., U. S. A.

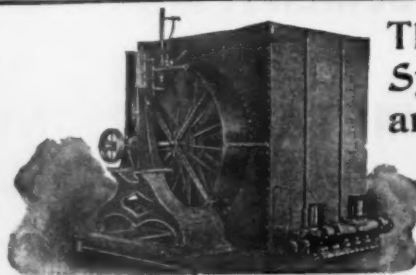
**Consulting and Contracting
ENGINEER.**

BRASS AND COPPER,

Sheet, Rod and Wire Plants,

Seamless Tube Machinery.

THE Hoover & Gamble Co.,
MANUFACTURERS OF
Twine and Cordage Mchy.,
with Latest Improvements.
MIAMISBURG, O.
Correspondence Solicited.



**The "A B C" Fan
System of Heating
and Ventilation**

furnishes a uniform de-
gree of heat and perfect
ventilation—is applicable
to Factories and Public
Buildings.

American Blower Company,

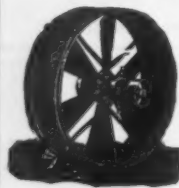
Heating, Ventilating and Drying Engineers,

DETROIT, MICH.

NEW YORK.

CHICAGO.

LONDON.



**VENTILATING
AND EXHAUST FANS.**

Will send our fans to compete with any other manufacturer,
and may then be returned at our expense if not just as we
represent them.

B. F. PERKINS & SON, Holyoke, Mass.



EXETER VENTILATING FANS

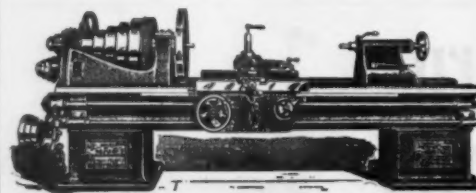
will move a larger volume of air with less power required and are lower
in price than any Fan in the market. We fully guarantee every one
to do all we claim and will send one on trial to any responsible party.

SEND FOR CIRCULAR AND PRICE-LIST.

EXETER MACHINE WORKS,

EXETER, N. H.

BOSTON, MASS.



Engine Lathes, 20 in. to 38 in.
Gap Lathes, 20 in. to 38 in.
Heavy Turret Lathes, 16 in., 18 in.
& 28 in. Radial Drills, 4 ft. arm.

H. C. FISH MACHINE WORKS,
Worcester, Mass., U. S. A.

RUDOLPHI & KRUMMEL,

96 N. Clinton St., Chicago, Ill.

Presses,

Dies,

Sheet Metal and

Wire Working

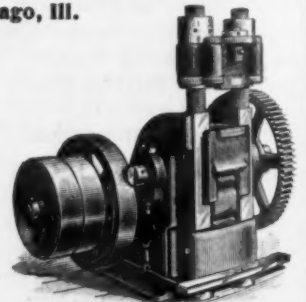
Machinery.



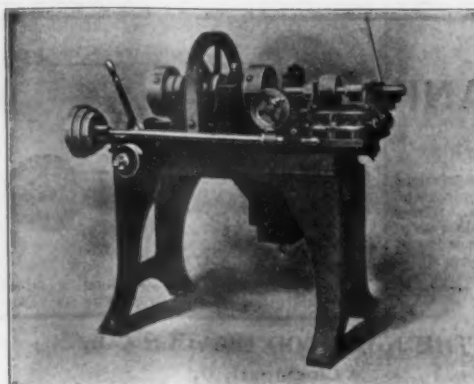
No 4 A Open Back Inclina-
ble Press with enlarged
frame bed.

Special Machinery for Manufacturing
Bicycles.

WRITE FOR CATALOGUE.



Two Post Toggle Press, for very heavy
stamping, embossing, etc.



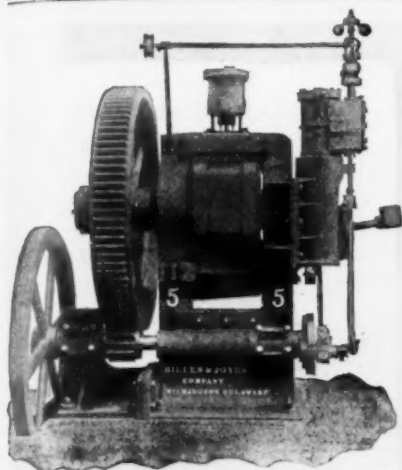
**CUTTING-OFF
MACHINES.**

The Latest and Best. Send
for Circulars.

GERMAN AGENTS:
Schuchardt & Schutte, Berlin and
Vienna

ENGLISH AGENTS:
Chas. Churchill & Co., Ltd., London
and Birmingham.

Hurlbut-Rogers Machine Co.,
SO. SUDBURY, MASS., U. S. A.



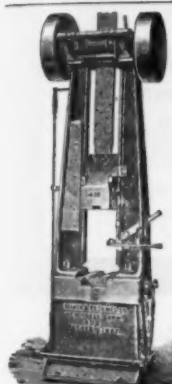
Guillotine-Frame Bar Shears.

THE various sizes of Shears of this type built by the Hilles & Jones Company cover all requirements from the lightest up to 4-inch square billets cold.

Open-throat Shears for bar work up to 4½-inch square.

New catalogue (176 pp.) describes and illustrates the various sizes, methods of driving, and will be sent to all interested parties upon application.

Hilles & Jones Company,
Wilmington, Delaware.



THE PECK DROP PRESS WORKS,

MINER & PECK MFG. CO., Proprietors.

New Haven, Conn., U. S. A.

Manufacturers of

PECK'S DROP PRESS, DROP LIFTER, FRICTION DROP HAMMERS,

HAND AND POWER DROPS FOR
ALL PURPOSES.



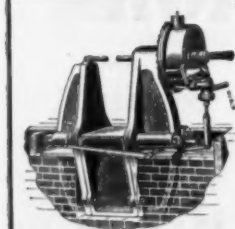
THE Scranton Power Hammers

possess all the good features other hammers have and many good features other hammers haven't.

Send for circular No. 25.

THE SCRANTON & CO.,
NEW HAVEN, CONN.

Prentiss Tool & Supply Co., New York.
Marshall & Hinchey Machinery Co.,
Chicago, Ill., and Cleveland, O.
Chandler & Farquhar, Boston, Mass.
Philadelphia Machinery & Supply Co.,
Philadelphia, Pa.
J. W. Wright & Co., St. Louis, Mo.
Chas. Churchill & Co., Ltd., London, Eng.



RIVETERS

Steam and Pneumatic.

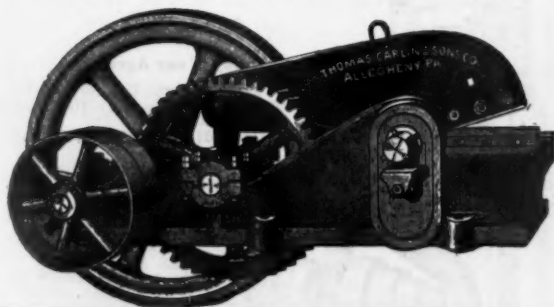
Our Vertical Gap Riveter is called the "Old Reliable."
Its reputation has made a name for it. We have
been building riveters for many years.

—Write for Catalogue.—

BETHLEHEM FOUNDRY & MACHINE CO.
South Bethlehem, Pa

Thomas Carlin's Sons Company,
ALLEGHENY, PA.

Manufacturers of



Shears,
Grinding Pans
and Contractors'
Machinery.

THE W. P. DAVIS MACHINE CO.,

BUILDERS OF FINE

Engine Lathes,

From 10 to 30 inch swing.

Upright Drills,

From 10 inch Sensitive to 36
inch, with B. G. and P. F.

—ALSO—

Keyseating and Cutting-off Machines.

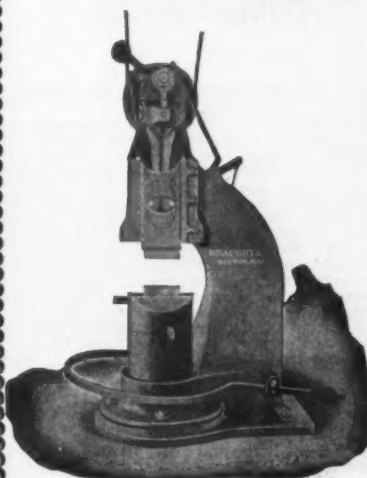
ROCHESTER, N. Y., U. S. A.

Send for Circulars and Photographs.



KEYSEATING MACHINE.

Beaudry Champion Power Hammer.



BEYOND COMPARISON.

Simplest, Best Design.

Most Efficient and Durable.

SEND FOR CIRCULAR.

Beaudry & Co.,

6 Oliver St.,
Boston, Mass.,
U. S. A.

CHAS. LEFFLER & CO.,

49-61 Clymer St., Brooklyn, N. Y.

PRESSES, DIES and TOOLS

FOR THE

Manufacture of Sheet Metal and Paper Goods.

Special Machinery, Experimental Machinery.

Metal-Edge Paper Box Machinery, Etc.

GENERAL MACHINERY

For Petroleum Cans, Powder Cans, Fruit Cans.

Sardine Boxes, etc., etc., etc.

Telephone, 753 W'msburgh.

AUTOMATIC MACHINERY

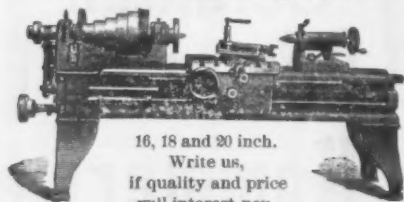
for making Wood-Screws, Rivets,
Stove and Tire Bolts, etc., also Special
Machinery to order.

ASA S. COOK CO.,

HUYSHOPE ST., - - HARTFORD, CONN.

THE "Cincinnati" Lathe.

"A good lathe at the right price."



16, 18 and 20 inch.

Write us,
if quality and price
will interest you.

SILK, ANDERSON CO.,

421-423 E. 2d St.,

CINCINNATI, OHIO

T.W.G. COOK,

2, 4, 6, Reade St., N. Y.

New and Old Presses,
every size, Bargains.

Large Geared Power Press.
Shaft 5 1/4 dia., 2 in. Throw,
6 ft. Driving Gear, Bed 12 x
24, \$250.

No 8 and 18 Bliss Power
Presses, 17 in. and 12 in
Bliss Drop Presses, Peck
Lifts, many others.

SEND FOR LIST AND
PRICES.



Engineers' and Mechanics' Pocket-Books.

Civil Engineer's Pocket-Book

Of Mensuration, Trigonometry, Surveying, Hydraulics, Hydrostatics, Instruments and their adjustments, Strength of Materials, Masonry, Principles of Wooden and Iron Roof and Bridge Trusses, Stone Bridges and Culverts, Trestles, Pillars, Suspension Bridges, Dams, Railroads, Turnouts, Turning Platforms, Water Stations, Cost of Earthwork, Foundations, Retaining Walls, etc. In addition to which the elucidation of certain important Principles of Construction is made in a more simple manner than heretofore. By J. C. TRAUTWINE, C.E. 12mo, morocco flaps, gilt edges. Revised and enlarged, with new illustrations, by J. C. TRAUTWINE, JR., C.E. \$5.00

Mechanics' and Engineers' Pocket-Book

Of Tables, Rules and Formulas pertaining to Mechanics, Mathematics and Physics, including Areas, Squares, Cubes, etc. Logarithms, Hydraulics, Hydrodynamics, Steam and the Steam Engine, Naval Architecture, Masonry, Steam Vessels, Mills, etc. Limes, Mortars, Cements, etc. Orthography of Technical Words and Terms, etc. By C. H. Haswell. 900 pages. 50th edition, 123d thousand. Leather, with flap. \$4.00

The Mechanical Engineers' Pocket-Book.

A reference book of Rules, Tables, Data and Formulas, for the use of Engineers, Mechanics and Students. By WILLIAM KENT, A.M., M.E., Consulting Engineer, Member Amer. Soc'y Mech. Engrs. and Amer. Inst. Mining Engrs. 1067 pages, 12mo, morocco flap. \$5.00

The 21st Edition of Nystrom's Pocket-Book of Mechanics and Engineering.

Revised, corrected and greatly enlarged, with addition of original matter. By WILLIAM DENNIS MARKS, Ph. B., C.E. (Yale S.S. S.). Twenty-first edition, further revised and corrected by ROBERT GRIMSHAW. Fully illustrated. 16mo. Over 700 pages. Pocket-book form, gilt edges. \$3.50

Sent, post-paid, on receipt of price by

DAVID WILLIAMS COMPANY,

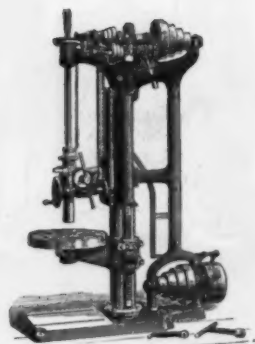
Publishers and Booksellers,

232-238 WILLIAM ST., NEW YORK.

The Cincinnati Upright Drills

are by far ahead of
all others, and this
is the universal ver-
dict of all who have
used them.

WE have a list of satisfied customers, all prominent in their respective lines, to whom we will gladly refer you for reports. A few moments' study on the question of a good Upright Drill might pay wonderfully well. We will gladly act as instructors, by sending on details at once.



Cincinnati Machine Tool Co.,

1935-1939 Western Ave.,

CINCINNATI, O.

Write for catalogue.

"THE AURORA"

NEW AND
IMPROVED

24-INCH SLIDING HEAD
BACK GEAR

Power Feed Drill

With Back Brace, Gibbed Sliding Head,
and Patent Automatic Stop.

FROM 12 TO 40 INCH SWING.

Send for New Catalog and Prices.

AURORA TOOL WORKS,

Aurora, Ind.,

or to any of our Agents:

Niles Tool Works Co., New York.
Strong, Carlisle & Hammond,
Cleveland.
Marshall-Huschart Mch. Co., Chi-
cago.
Frank Toomey, Philadelphia.
The L. Rumsey Mfg. Co., St. Louis.
The Park & Lacy Co., San Francisco.
The U. Baird Mch. Co.,
Pittsburg.
The O. L. Packard Mch.
Co., Milwaukee.
The A. R. Williams Mch.
Co., Toronto, Ontario.
C. C. Wormer Mch. Co.,
Detroit.
Scott Tool Supply Co.,
Denver.
Carolina Supply Co.,
Greenville, S. C.
Morton, Reed & Co.,
Baltimore.



"THE STANDARD" SCALES,

For Railroads, Mines, Mills, Warehouses and all Purposes.

Used by U. S. Government, Leading Railroads and Manufacturers.

THE STANDARD SCALE AND SUPPLY CO., Limited,

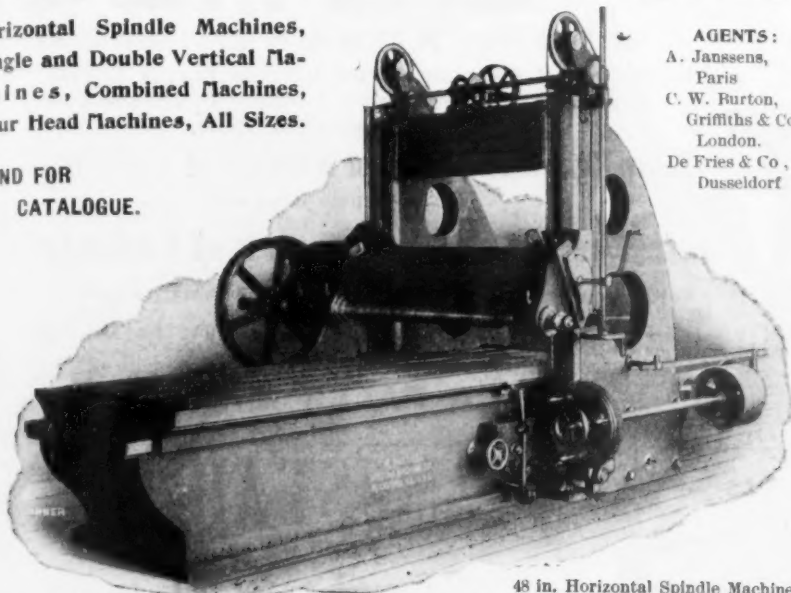
MANUFACTURERS, Pittsburgh, Pa.



Heavy Milling Machines Exclusively.

Horizontal Spindle Machines,
Single and Double Vertical Ma-
chines, Combined Machines,
Four Head Machines, All Sizes.

SEND FOR
CATALOGUE.



48 in. Horizontal Spindle Machine.

THE INGERSOLL MILLING MACHINE CO.,

P. O. Box 350, Rockford, Ills., U. S. A.

EASTERN BRANCH: 126 LIBERTY ST., NEW YORK.

AGENTS:
A. Janssens,
Paris
C. W. Burton,
Griffiths & Co.,
London.
De Fries & Co.,
Dusseldorf

SMOOTH-ON CASTINGS.

An iron cement for repairing blemishes or blowholes in iron or steel castings. When hard this cement has the same color and appearance as cast iron and will withstand a red heat, steam, water or oil. Write for catalogue and prices.

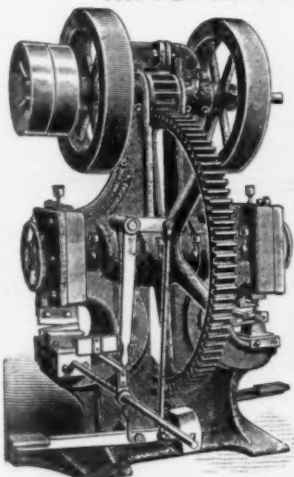
SMOOTH-ON MFG. CO.,

549-551 Communipaw Avenue,

JERSEY CITY, N. J.

VREELAND TOMPKINS, Chemist.

THE LATEST IMPROVED COMBINED Punch and Shearing MACHINE.



For
General
Jobbing and
Machine
Shops,
Blacksmiths,
Fence
Makers, etc.

CAN BE USED
SEPARATELY
EITHER AS
PUNCH OR
SHEAR.

Of the very
latest design,
made from
best ma-
terials only,
and provided
with clutches
to operate
with both
lever and
treadle.

No. 1.—Shears 6 x 1/4 in. Flat Iron and 1/4 in. Round
Iron. Punches 1/4 in. hole through 1/4 in. iron.
No. 2.—Shears 6 x 1/4 in. iron. Punches 1 in. hole
through 1/4 in. iron.
No. 3.—Shears 10 x 1/4 in. iron. Punches 1/4 in. hole
through 1/4 in. iron. Cuts 2 in. Round Bar Iron.
Single End Punch and Shears, same capacity as com-
bined machines.

SEND FOR CIRCULAR.

ROYERSFORD FOUNDRY and MACHINE CO.,
Royersford, Pa., U. S. A.



18 and 24 inch

SHAPERS ENGINE LATHES

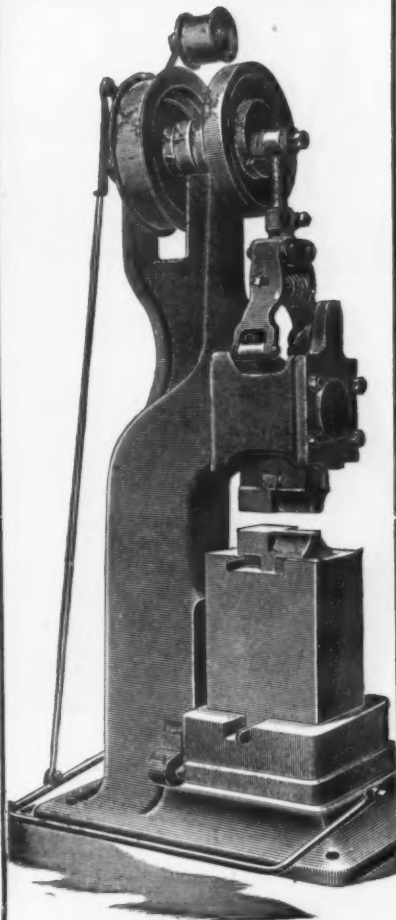
Eighteen, Twenty-two and Twenty-four in.

The Barker & Chard Mach. Tool Co.,

HARRISON & CULVERT STS.,
CINCINNATI, O., - - U. S. A.

AGENTS:—Marshall & Hushart Mch. Co., Chi-
cago; Prentiss Tool & Supply Co., New York;
Monongahela Mch. Tool Co., Pittsburgh.

THE DUPONT

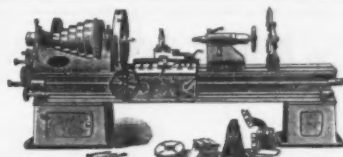


POWER HAMMERS

You ought to have
them.

Send for catalogue.

Dupont Manufacturing Co.,
ST. JOHNSBURY, VT., U. S. A.



NEW HAVEN MANUFACTURING CO.

NEW HAVEN, CONN.

Manufacturers of

IRON-WORKING MACHINERY

Planers, Shapers, Drills, Slotters, Etc.

CHAS. CHURCHILL & Co., Ltd., Agts., London, England

The Pocketbook of Pocketbooks. Being Moles-
worth's "Engineers" and Hurst's "Architects"
pocketbooks bound together. By SIR GUILFORD
LINDSAY MOLESWORTH AND J. T. HURST. 1316 pages,
limp russet.....\$3.00
For sale by David Williams Co., 232 William St., N.Y.

STAR FOOT AND POWER LATHES.



(New Century Pattern.)

9 and 11 inch swing. 24, 36, 48 and 60 inches between Centers.

"Up to Date," Complete Screw Cutting Engine Lathes, with Automatic Cross-Feed, with or without Compound Rest, Friction-Countershaft, etc.

Heavy, Rigid, Accurate, Correct in Design and Highly Finished.

COMBINING THROUGHOUT THE

Best Material with the Highest Class of Workmanship.

We build these Tools in large quantities, with Special Machinery, and make prices very low. QUALITY considered.

Adapted for Tool-Makers and Gunsmiths, Bicycle, Electrical and Fine Accurate Machine Shop Service.

We think our Catalogue B would repay your investigation. Shall we mail it?

SENECA FALLS MFG. CO.,

255 Water Street,

SENECA FALLS, N. Y., U. S. A.

THE MOST AIR FOR \$1

IS GIVEN BY

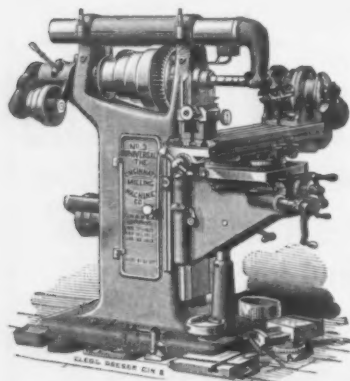
The **Green Rotary Pressure Blower,**

And it weighs less, occupies less space, and is more positive in action than any other blower.

SEND FOR NEW CATALOGUE B.

Wilbraham Baker Blower Co.,
2518 Frankford Ave., Philadelphia, U. S. A.

Sales Agents, FRASER & CHALMERS, Inc., Chicago, Ill., and Branch Houses.



THE UNIVERSALITY

of The "Cincinnati Miller" is the admiration of all who have used it. One needs but to examine or study its various parts to become acquainted with the many kinds of work that can be produced with this machine tool. Will you investigate? Book free

THE CINCINNATI MILLING MACHINE COMPANY,

Cincinnati, Ohio, U. S. A.

EUROPEAN AGENTS:

Schuchardt & Schutte, Berlin, Vienna, Brussels, Stockholm, Cologne and New York.
Adolph Janssens, Paris.
Chas. Churchill & Co., Ltd., London, Birmingham, Manchester, Glasgow.
The Niles Tool Works Co., 39 Victoria St., London.

MANUFACTURING

TURRET LATHE.

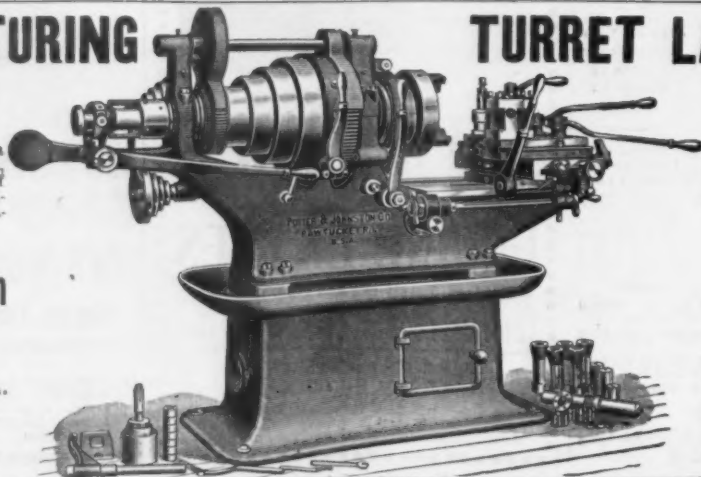
THIS Lathe is made in a variety of combinations, and is adapted for all kinds of work ordinarily done on engine lathes or turret machines.

Potter & Johnston Company,

Pawtucket, R. I., U. S. A.

New York Office, 126 Liberty Street.

E. Walter H. Foster, Manager.



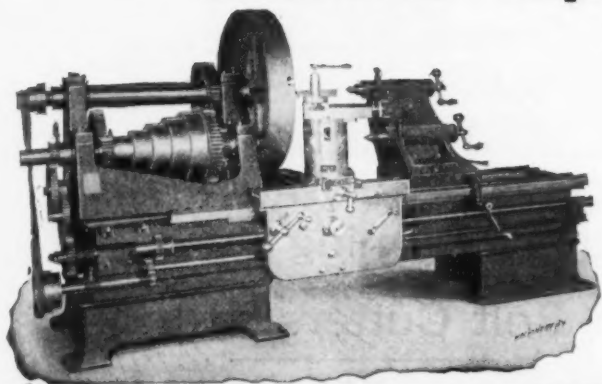
Write for catalogue of our Universal Shaping Machines and Automatic Chucking and Turning Machines.

FOREIGN AGENTS:

Chas. Churchill & Co., London, Birmingham and Manchester, England, and Glasgow, Scotland.
Gustav Dieckmann & Sohn, Berlin, Germany.
Adolph Janssens, Paris, France, and Brussels, Belgium.
V. Lowener, Copenhagen, Denmark, and Stockholm, Sweden.

McCabe's Patent Double Spindle Lathe,

Combines TWO Complete Lathes in One.



A 26 inch Swing. Back geared 11 to 1 for doing the common range of work, and

A 44 inch Swing. Triple geared 22 to 1 or with Geared Face-plate 66 to 1 for doing the heaviest classes of work up to the full swing.

Swings as much over the carriage (39 inches) as a regular 54 in lathe.

Adapted for all classes of work both large and small and costs but little more than an ordinary medium size lathe.

Send for Catalog and see the list of shops that have them.

J. J. McCABE,

14 DEY STREET, - - - NEW YORK.

Boston Blower Co.,

FAN AND PRESSURE BLOWERS,
EXHAUST FANS,

FOR ALL USES.

Hot Blast Heating Apparatus,
Dry Kiln Outfits,
Steam Fans, Forges,
High and Low Pressure Engines.

Glenwood and Busner Sts., - HYDE PARK, MASS.

New York Office, 39 Cortlandt St.



SEND FOR CIRCULARS.

PORTABLE POWER TOOLS.

Electric Portable Drills.

Electric Furnace Mouth Drills.

ELECTRIC HORIZONTAL TRUCK
DRILLS.

Electric Portable Horizontal Drilling
and Boring Machines.

PORTABLE ELECTRIC WOOD PLANERS.

Pneumatic Chipping and Rivet-
ing Tools and Machinery,

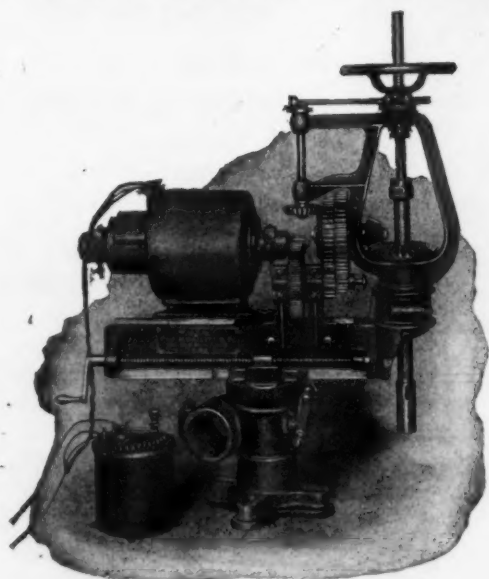
&c., &c., &c.

SEND FOR CATALOGUE.

Thos. H. Dallett & Co.,

York St. and Sedgley Ave.,

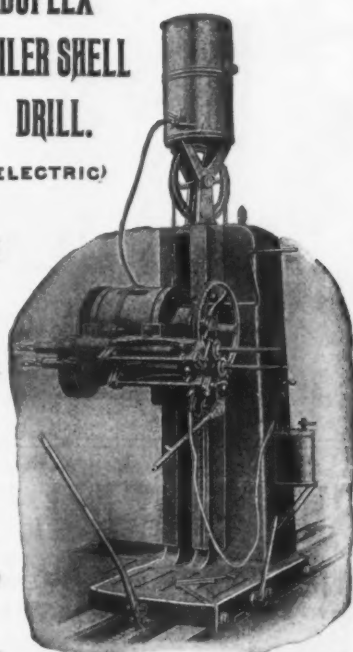
PHILADELPHIA, PA., U. S. A.



Electric Portable Drill.

DUPLIX
BOILER SHELL
DRILL.

(ELECTRIC)



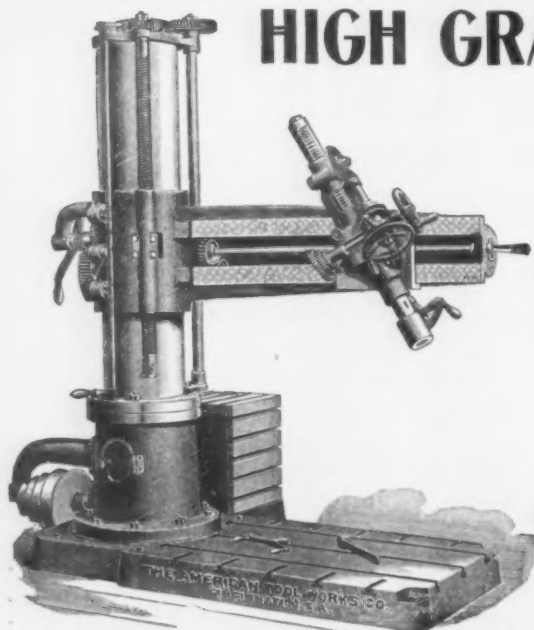
We Want to Build Machines

or machine parts, by contract, and to furnish first-class Brass Castings. We have a Modern Machine Shop, Brass Foundry and Coppersmith Shop, and every facility for doing these things well. Send sample or blue prints for estimate.

J. B. Chapman & Co., - Springfield, Mass.

PRESSES, DIES, AND OTHER
SHEET-METAL TOOLS
FERRACUTE MACHINE CO.
BRIDGETON, N.J.

See large adv. next week.



HIGH GRADE STANDARD TOOLS.

Lathes, Planers, Shapers,
Screw Machines,
Punches and Shears,
Cutter and Reamer Grinders,
Drill Presses, Radial Drills,
Pulley Turning Lathes,
Patented March 21, 1893.
Bolt Cutters, etc.

THE AMERICAN TOOL WORKS CO.,

Builders of Complete Lines of Machine Tools.

WORKS: CINCINNATI, U. S. A.

6 FT. RADIAL DRILL—HALF UNIVERSAL.

New York Office: 120 Broadway, Geo. Place, Agent.

Philadelphia: The Fairbanks Co.

New Orleans: The Fairbanks Co.

LONDON: Alfred Herbert, Ltd., 7 Leonard St., Finsbury, E.C.

DUSSELDORF: De Fries & Co., Act. Ges., Graf Adolph Strasse, 83-87.

VIENNA: De Fries & Co., Act. Ges., Eichenbachgasse, 9.

Chicago Store: 68-70 South Canal Street.

Baltimore: The Fairbanks Co.

Cleveland: The Strong, Carlisle & Hammond Co.

COVENTRY: Alfred Herbert, Ltd.

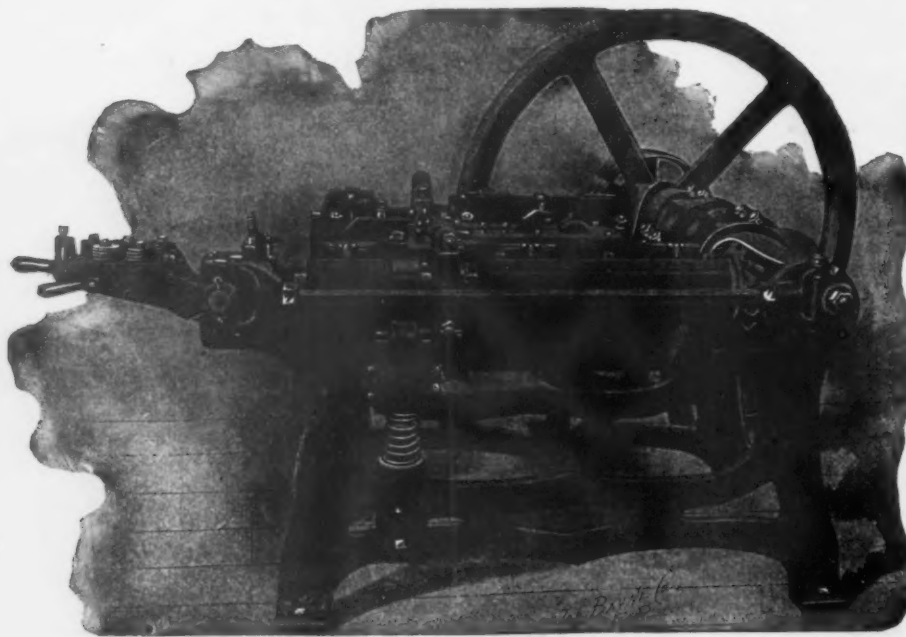
BERLIN: De Fries & Co., Act. Ges., Kloster Strasse, 13-15.

PARIS: Roux Frères & Cie., 54 Boulevard du Temple.

ANTWERP: Nyssens Frères, 33 Rue des Peignes.

MOSCOW: Alfred Stucken.

"THE BATES" WIRE NAIL MACHINE,



Guaranteed Without An Equal.

BUILT BY THE

Bates Machine Co.

JOLIET, ILL.

MARKT & CO.,

193 WEST ST., NEW YORK,
European Agents.

Also manufacturers of

Wire Drawing Machinery.

" Barbing "

" Galvanizing "

" Pointing "

" Stapling Machines,

" Nail Barbing Machines,

" " Rumbling "

SHEET METAL WORKING M'CHY . .



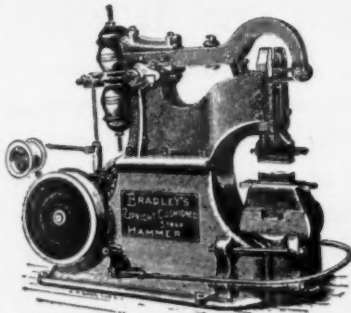
PUNCHES, SHEARS,
STRAIGHTENING ROLLS
FOR HAND OR POWER.
MODERN, PRACTICAL,
DURABLE AND ECONOM-
ICAL. WRITE FOR CIRCULARS.

BERTSCH & CO.,

CAMBRIDGE CITY, - - - IND.



BRADLEY HAMMERS



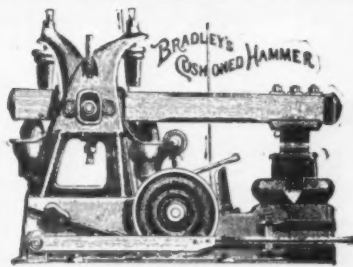
are made in Helve and Upright styles with heads weighing 15 to 500 pounds and forge stock $\frac{1}{8}$ to 5 inches diameter.

Each contains $\frac{1}{8}$ to $\frac{1}{2}$ more material than any other of same rating.

Their Anvil Blocks weigh nearly or quite double those of other Hammers.

Their output is guaranteed 25 per cent. greater than is possible with other Hammers of same rating, or no sale.

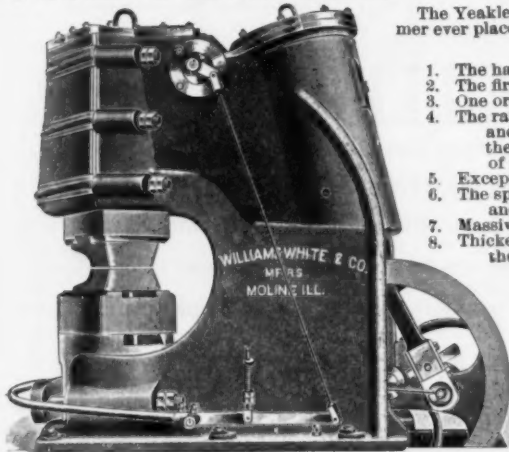
SEND FOR CIRCULARS.



FOREIGN AGENTS:
SCHUCHARDT & SCHUTTE, Berlin, Cologne, Vienna,
Brussels, Stockholm, St. Petersburg.
BUCK & HICKMAN, Whitechapel Road, London.
MONTGOMERY & CO, 23 Boulevard Magenta, Paris.

THE BRADLEY CO.
SYRACUSE, N. Y.

THE YEAKLEY VACUUM POWER HAMMER



The Yeakley Vacuum Hammer is the most ingenious and novel invention in the shape of a power hammer ever placed on the market. It never fails to excite a lively interest. Its users are enthusiastic.

POINTS OF ADVANTAGE:

1. The hammer is always wide open—that is, the ram is always clear up, ready for a full blow.
2. The first blow can be delivered at full speed and lightning quickness.
3. One or more blows can be given and then stop.
4. The ram is guided on all four sides. There is no hammer on the market so thoroughly, completely and massively guided, thus insuring accuracy and a true blow. Owing to this fact and because the guides are so massive, dies can be placed out of center, and work forged first on one side of the ram, and then on the other, without injury to the hammer.
5. Exceptionally large die surfaces—almost as much as drop hammers.
6. The speed remains the same when working light or heavy: It is frequently desired to strike light and quick both.
7. Massiveness and durability. There are no connections of any kind to the ram to give trouble.
8. Thicker bars can be worked on these than on other hammers without choking or destroying the force of the blow.
9. Control of blow is fine. A light steady blow can be given with the heaviest sizes as well as the heaviest blows desired.

We are also the manufacturers of the Bulldozers, now so widely used. We also build Drop Hammers, of both the crank lift and board types, Punching and Shearing Machines, for all purposes, Eye Benders, Roll Tapering Machines. In fact we furnish Complete Outfits for making railroad specialties (such as brake beams, steel trucks, etc.) for agricultural implement, barn door hanger, metal wheel manufacturers, etc., to bend, form, shear, punch, forge and rivet. Correspond with us for particulars.

WILLIAMS, WHITE & CO., - Moline, Ills., U. S. A.



No. 1, Ring and Circle Shear.

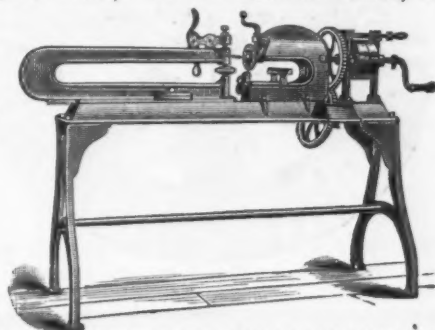
No. 11 will cut No. 22 iron and lighter. Circles from $3\frac{1}{2}$ to 15 in. in diam.
No. 13 " " No. 22 " " " " $3\frac{1}{2}$ to 40 " "
No. 15 " " No. 18 " " " " 5 to 48 " "
No. 16 " " No. 14 " " " " 6 to 60 " "

MADE BY

Niagara Machine & Tool Works,
BUFFALO, N. Y.

Manufacturers of Sheet Metal Tools.

Write for Catalogue.



QUINT'S TURRET DRILLS.

FOR DRILLING and TAPPING.

Is the only drilling machine made that will finish a hole in one operation without moving work and prevents the loss of time in changing tools.

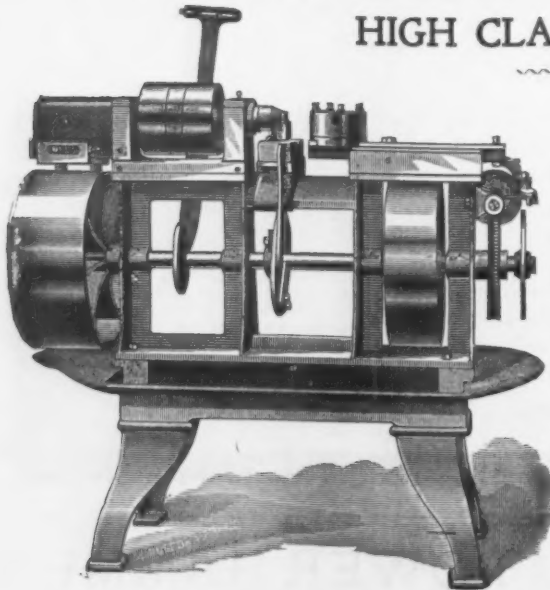
These **TURRET DRILLS** are made with from 4 to 12 spindles, and will do the work of a light turret lathe, with this advantage, the tools revolve instead of the work.

SEND FOR CATALOGUE.

A. D. QUINT, - **No. 8 Clinton Street, Hartford, Conn.**

THE PRATT & WHITNEY COMPANY,

HIGH CLASS MACHINE TOOLS.



Hartford Automatic Screw Machine.

Hartford Automatic Screw Machines.

In ten sizes, for making Screws, Studs, Bicycle Hubs and other pieces of circular cross section and various outlines from bars of round, square or hexagon metal, in diameter 1-16 to 3 1-16 inches. All needed adjustments are provided for. One man can attend a half dozen machines.

Tools made to order for finishing pieces to sample.

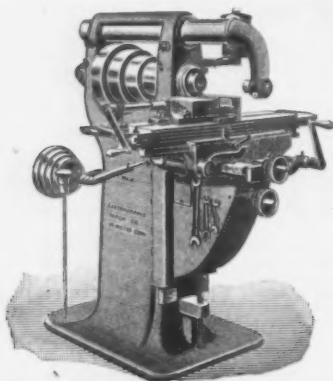
Write for further particulars and "Hardware" Catalog.

PRATT & WHITNEY COMPANY,

Works: HARTFORD, CONN.

BRANCHES: New York, 123 Liberty St.; Boston, 144 Pearl St.; Chicago, 42 S. Clinton St.; Buffalo, Seneca and Wells Sts.

FOREIGN REPRESENTATIVES: London, England, Buck & Hickman, 280 White-chapel Road; Paris, France, Fenwick Freres & Co., 21 Rue Martel; Copenhagen, Denmark, and Stockholm, Sweden, V. Lowener; Dusseldorf, Germany, and Vienna, Austria, de Fries & Co.



OUR PLAIN MILLING MACHINE

IS DESIGNED MORE ESPECIALLY FOR
A MANUFACTURING MACHINE.

We have used plenty of metal and have distributed same with the idea of insuring strength and rigidity where most needed.

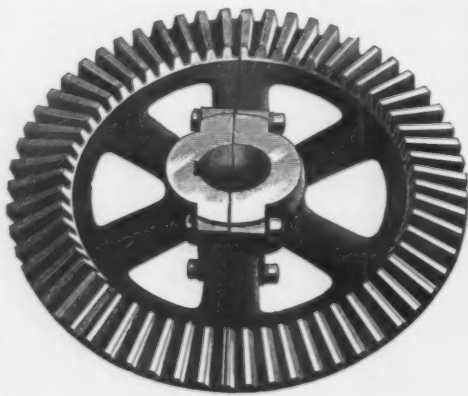
There are many good points about this machine which are explained in our descriptive circular, which will be sent upon application.

If you are in the market for a machine of this class and size we think this machine will please you.

THE CARTER & HAKES MACHINE CO.,

WINSTED, CONN., U. S. A.

WALTER H. FOSTER, 126 Liberty St., New York, Sales Manager.



Bevel or Mitre Gears

Are made in different ways; sometimes with the teeth cast, necessarily imperfect in fit, wasteful of power and extravagant in ultimate cost. The next, rough cut and hand finished, a great improvement, but not up to the mark yet.

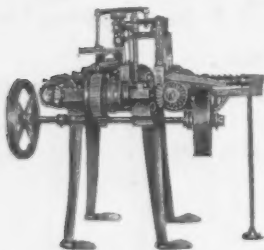
We use special machines and plane the teeth theoretically correct, so that the maximum economical limit is attained.

We would like to figure with you for this class of work, and can cut up to eight feet in diameter.

R. D. NUTTALL COMPANY,

Pittsburg, Pa.

The article shown on the opposite side was



made on this machine.

AUTOMATIC MACHINES

or any kind of special machinery
for rapid work

DESIGNED AND BUILT.

Special Power Presses, Wire Forming Machinery, Hook and Eye, Safety Pin and all kinds of Pin Machinery.

LET US KNOW YOUR NEEDS.

The A. H. NILSON MACHINE CO., Bridgeport, Conn., U. S. A.

This difficult piece was made on the machine

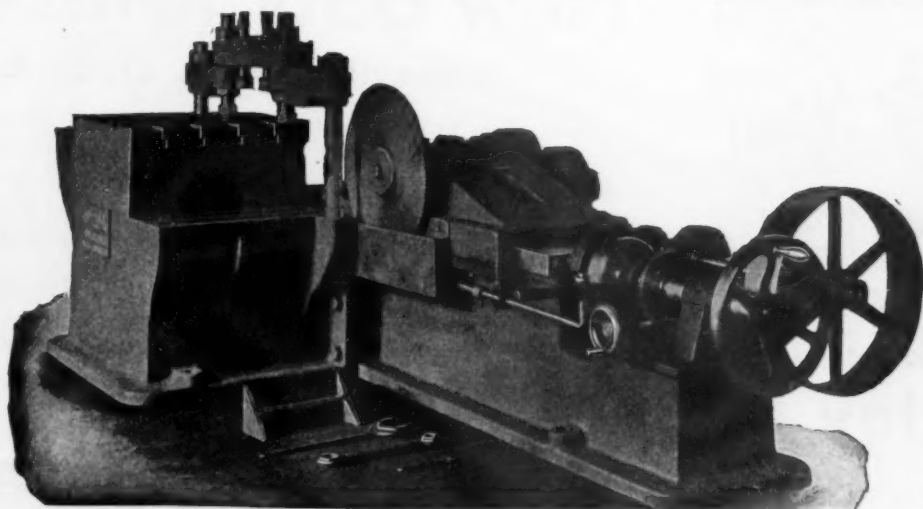


shown on the opposite side of this advertisement.

LUCAS & GLIEM

Patent Universal Cold Saw Cutting Off Machine.

Automatic
Saw
Sharpening
Machines.

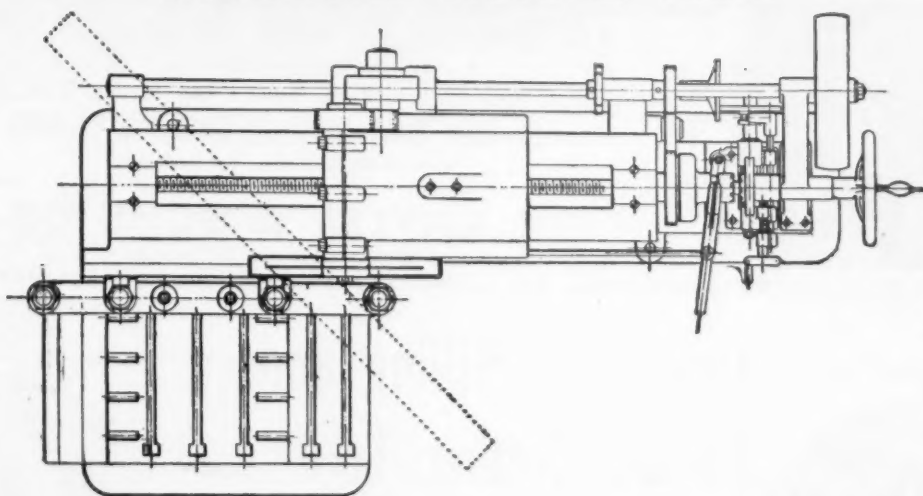


Boring
Machines.

Milling
Machines.

Rotary
Planing
Machines.

Slotting
Machines.



Portable
Electric
Driven
Tools.

PATENTED AUG. 8, 1899.

Special Machine Tools of Every Description Designed and Built. Either Belt or Electric Driven.

Ridge Avenue and Hamilton Street, - PHILADELPHIA, PA., U. S. A.

Hill, Clarke & Co., 156 Oliver St., Boston, Mass.
Hill, Clarke & Co., 12 S. Canal St. Chicago, Ill.

SELLING AGENTS

U. Baird Machinery Co., 125 Water St., Pittsburg, Pa.
Walter H. Foster, 126 Liberty St., New York.

Chicago Pneumatic Tool Co.,

LONG-STROKE RIVETING HAMMER.

PNEUMATIC
TOOLS

For All Branches

IRON WORK.



DRIVES RIVETS 1 INCH IN DIAMETER.

SENT ON
TRIAL

For Approval
Our Expense.

New York Office,
95 LIBERTY ST., N. Y.

General Offices,
MONADNOCK BLOCK, CHICAGO.



Splitting Shear.

PUNCHING and SHEARING MACHINERY.

HAND AND BELT POWER.

MADE BY

New Doty Mfg. Co.,

Janesville, Wis., U. S. A.

The Shear shown in cut is designed for splitting heavy sheets. It will split sheets of any width or any length and three-fourths inch or less in thickness. It is also fitted with special knives for cutting angle iron up to and including four-inch angles. It cuts the angle iron square off without destroying the shape of the angle.

SEND FOR CATALOGUE.

Bayley Steam Hot Blast - - Heating Apparatus



For FACTORIES, MACHINE SHOPS, and all
FOUNDRIES, LARGE BUILDINGS

IS UNEQUALED.

Manufacturers of Structural Iron Work, Foundry and Machine Work, Steam Traps,
High Grade Heavy Machinery Castings a Specialty.

Write for full particulars and catalogue.

WM. BAYLEY & SONS CO.,

732-766 Greenbush St., Milwaukee, Wis.

Adjustable Milling and Thread Cutting Tool

FOR GENERAL BRASS FINISH-
ING AND MACHINE WORK.

On a basis of adjustments of $\frac{1}{4}$ of an inch, a set of three of these adjustable mills would represent no less than 96 SOLID MILLING TOOLS, think of it, 96!

CATALOGUE MAILED UPON APPLICATION.

The John M. Rogers,
Boat, Gauge and Drill Works,
GLOUCESTER CITY, NEW JERSEY, U. S. A.

ALL
KINDS

PRESSES, DIES AND TOOLS

FOR CUTTING AND FORMING ARTICLES OF SHEET METAL, WIRE, LEATHER, PAPER, &c.
AUTOMATIC CAN MAKING AND SPECIAL MACHINERY.

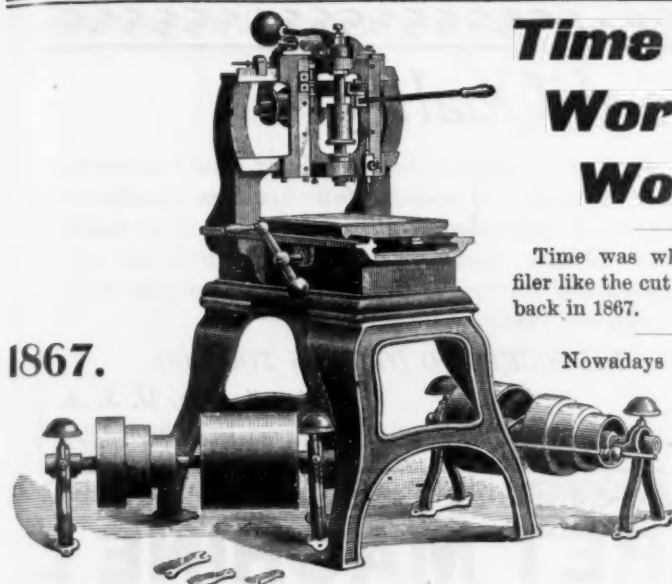
CORRESPONDENCE SOLICITED.

ADRIANCE MACHINE WORKS,

Near Hamilton Ferry.

124 IMLAY ST., BROOKLYN, N. Y., U. S. A.

Time Works Wonders.

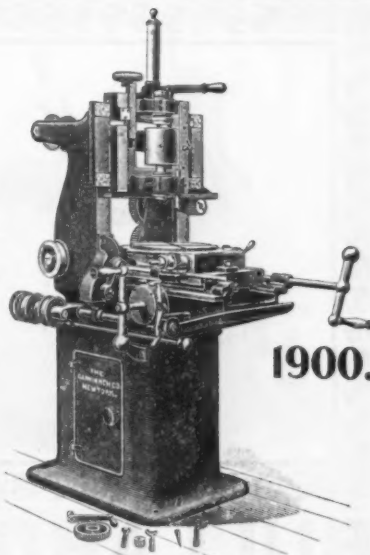


1867.

Time was when we built a Profiler like the cut shows. 'Twas away back in 1867.

Nowadays we build an up-to-date Improved Profiler,
1900 Model.

Many new and important features of construction and design have been added



1900.

Perhaps you are interested enough to write us. We will return you some pleasing information.

The Garvin Machine Co., Spring and Varick Sts., New York.

SALES AGENTS—The Garvin Machine Co., 51 No. 7th St., Philadelphia, Pa. Manning, Maxwell & Moore, 22 So. Canal St., Chicago, Ill. Deutsche Garvin Maschinen-Fabrik, Aktiengesellschaft, 17 Burg Strasse, Berlin, G. Germany. C. W. Burton, Griffiths & Co., Ludgate Square, Ludgate Hill, London, E. C., England. Montgomery & Co., 28 Boulevard Magenta, Paris, France.

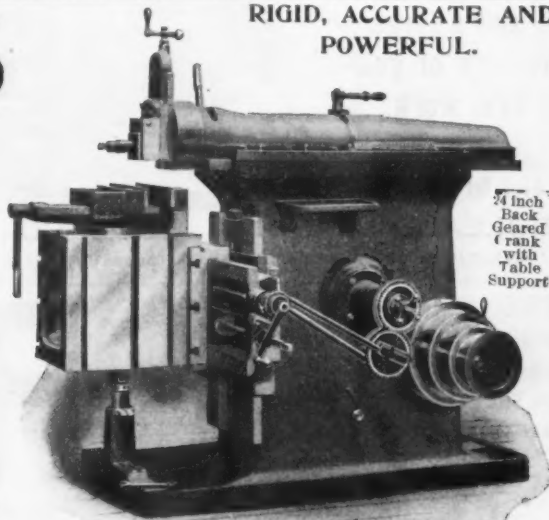
SHAPERS

Back Geared Crank

Eight cutting speeds to ram with quick return.
Opening through column under Ram for keyseating.
Gears large diameter, wide face, and coarse pitch
Great weight, large wearing surfaces.
Cutting power unequalled.

Sizes, 16-inch, 20-inch
and 24-inch Strokes.

RIGID, ACCURATE AND
POWERFUL.

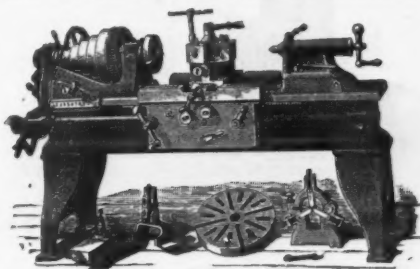


24 inch
Back
Geared
Crank
with
Table
Support

THE CINCINNATI SHAPER CO.,
Cincinnati, O., U. S. A.

It Makes Little Difference How Skillful

your machinists are, they cannot do good Lathe work on a poor Lathe. Our Lathes are uncommonly good ones. They're stiff, powerful and heavy, and are built especially to meet the exacting requirements of shop owners who do a high grade of work. These Lathes cut entire index of threads and feeds without changing gear or belt, and, with their improvements, will do a great deal more and better work than the old types. Sizes: 14 in. to 42 in. swing. Beds in even lengths.



THE LODGE & SHIPLEY MACHINE TOOL CO.,
CINCINNATI, OHIO, U. S. A.

AGENTS—Sells, Sonnenthal & Co., 35 Queen Victoria Street, London, England; Markt & Co., Ltd., 5 Pickhuben, Hamburg, Germany; Adler & Eisenhitz, Milan, Italy; Prentiss Tool & Supply Co., New York and Buffalo, N. Y.; The Lodge & Shipley Machine Tool Co., Bourse, Philadelphia, Pa.; Marshall & Huschart Machinery Co., Chicago, Ill., and Cleveland, Ohio; W. R. Colcord Machinery Co., St. Louis, Mo.; Vonnegut Hardware Co., Indianapolis, Ind.; Parke & Lacy Co., San Francisco, Cal.; Brown & Zortmann Machinery Co., Pittsburgh, Pa.

FINISHED MACHINE KEYS

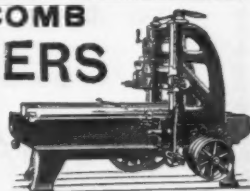
Morton Manufacturing Co., Office and Works,
MUSKEGON HEIGHTS, MICH., U. S. A.

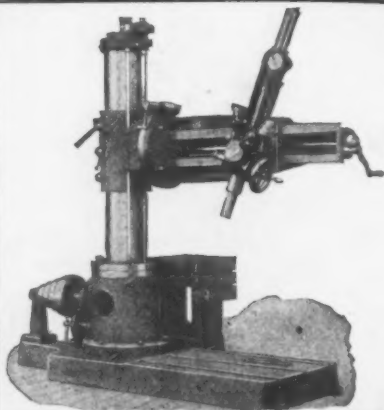


WHITCOMB PLANERS

Send for Price.

WHITCOMB
MFG. CO.,
Worcester, Mass.





Bickford Quality

Is the result of 25 years of hard work and good engineering. Our line of radial and multiple drills has been steadily improved and to-day embodies all features requisite to modern practice. Drilling machinery is a specialty with us, not a side issue, and we are to-day building the best that brains and money can produce.

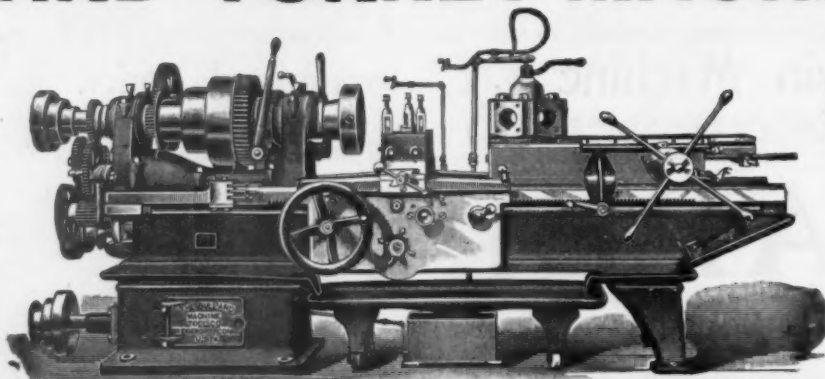
THE BICKFORD DRILL & TOOL CO.,

Cincinnati, Ohio, U. S. A.

FOREIGN AGENTS: Schuchardt & Schutte, Berlin, Vienna, Brussels, Cologne, Stockholm, St. Petersburg, Chas. Churchill & Co., London, Birmingham, Manchester, Glasgow, Adpho. Janssens, Paris, France. F. W. Horne, Yokohama, Japan.

BULLARD TURRET MACHINE L.

Suitable for
STUDS
and
BOLTS
and a large
variety of gen-
eral work.



Also
Boring
and
Turning
Mills.

Send for Catalogue.

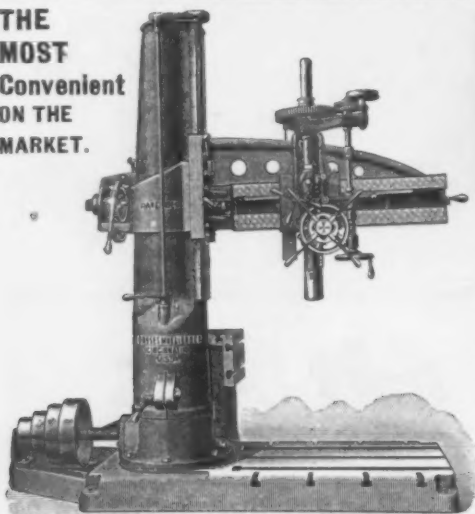
Send for Catalogue.

BULLARD MACHINE TOOL CO.,

Bridgeport, Conn., U. S. A.

MARSHALL & HUSCHART MACHINERY CO., Chicago, Cleveland and Cincinnati. SCHUCHARDT & SCHUTTE, Berlin, Vienna, Cologne, Stockholm and St. Petersburg. ADOLPH JANSSENS, Paris. CHARLES CHURCHILL & Co., Ltd., London, Birmingham, Manchester and Glasgow.

THE
MOST
Convenient
ON THE
MARKET.



RADIALS

All manipulations, as Starting, Stopping, Engaging and Disengaging, Back Gears, Reversing Quickly for Tapping, Changing Feed, etc., can be performed by the operator without leaving his seat.

Great Time, Tool and Manual Labor Savers.

No extra charge for Tapping Attachment.

DRESES, MUELLER & CO., Cincinnati, O., U. S. A.

AGENTS:

Manning, Maxwell & Moore, New York, Pitts-
burgh, Chicago.
The Niles Tool Works Co., Boston.
Pacific Tool & Supply Co., San Francisco.
Seig. Sonnenthal & Co., London.
E. Sonnenthal, Berlin.

G. Schinz, St. Petersburg.
G. Koppen & Co., Moscow.
V. Lowener, Copenhagen.
Wih. Soasson & Co., Valmo, Sweden.
Van Rietshoten & Houwens, Rotterdam.
Stüssi & Zweifel, Milan, Italy.

**B. F. BARNES UPRIGHT DRILLS,
XX. CENTURY TOOLS,
LATEST and BEST DRILLS on the Market.**

Excel others in.. DESIGN, STRENGTH, EASE OF OPERATION,
WORKMANSHIP AND FINISH.

We will be glad to send you printed matter and to give you details.

B. F. BARNES COMPANY, Rockford, Ills.

THE NEW METAL WORKER PATTERN BOOK.

A Treatise on Pattern Cutting as Applied
to all Branches of Sheet Metal Work,

By GEORGE W. KITTREDGE.

430 Pages; 744 Illustrations; size, 10 x 13
inches, Cloth Bound, Price, . . . \$5.00.

*The Most Elaborate and Complete Work that has ever been brought
out for the use of Sheet Metal Pattern Cutters.*

Printed from new type with a new and improved arrangement, especially convenient
for reference and study.

Parts of the former treatise, entitled *The Metal Worker Pattern Book*, have been utilized
in the preparation of this

GREATLY ENLARGED AND IMPROVED WORK,

but these have been REWRITTEN AND SIMPLIFIED, and later methods embodied which have come
into use since the publication of the original work.

218 Problems are now given,
75 of which are entirely new

The greatest care has been taken with the explanatory portions of the work, enabling the
student, without any previous training in mathematics and drawing, to become a FINISHED
PATTERN CUTTER.

Apprentices and Students will find the entire subject presented in such a manner as will
facilitate systematic study.

Tinners and Cornice Makers will here find elucidated every problem of ordinary occurrence,
from the simplest to the most complex

Triangulation is here for the first time treated systematically and in a way to meet the
practical needs of the trade.

The opening chapters are devoted to the preliminary information necessary to give the
student a thorough understanding of the subject, treating the topics fully and with appropriate
illustrations. The work is comprised in the following chapters:

- I. Terms and Definitions—15 Pages,
- II. Drawing Instruments and Materials—13 Pages,
- III. Linear Drawing—6 Pages,
- IV. Geometrical Problems—35 Pages,
- V. PRINCIPLES OF PATTERN CUTTING—25 Pages,
- VI. PATTERN PROBLEMS (3 Sections)—325 Pages.
 1. MITER CUTTING,
 2. FLARING WORK,
 3. TRIANGULATION.

This work in its perfected form is a complete

Encyclopedia of Pattern Problems

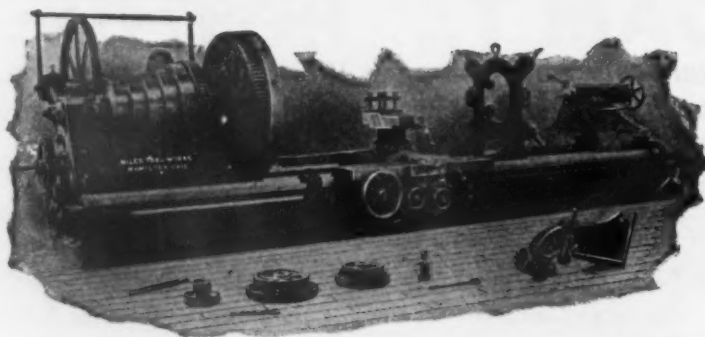
for Tinners, Cornice Makers and Sheet Metal Workers, all of whom should be provided with
a copy.

Sent, Express or Postage paid, on receipt of price, FIVE DOLLARS, by

DAVID WILLIAMS COMPANY, Publishers, 232-238 William St., New York.

NILES

TOOL WORKS CO., HAMILTON, O., U. S. A.



40 in. ENGINE LATHE No. 4735.

Latest types of Labor Saving Machines used in the manufacture of Marine, Locomotive and Stationary Boilers.

DESIGNERS, BUILDERS AND CONSTRUCTORS OF MACHINE TOOLS FOR ALL PURPOSES.

BRANCHES:

NEW YORK—136-138 Liberty street.
(Cablegrams "Nileswork, New York.")
BOSTON—65-67 Oliver street.
PHILADELPHIA—178 Bourse Building.
PITTSBURGH—918 Carnegie Building.
CHICAGO—512 Western Union Building.

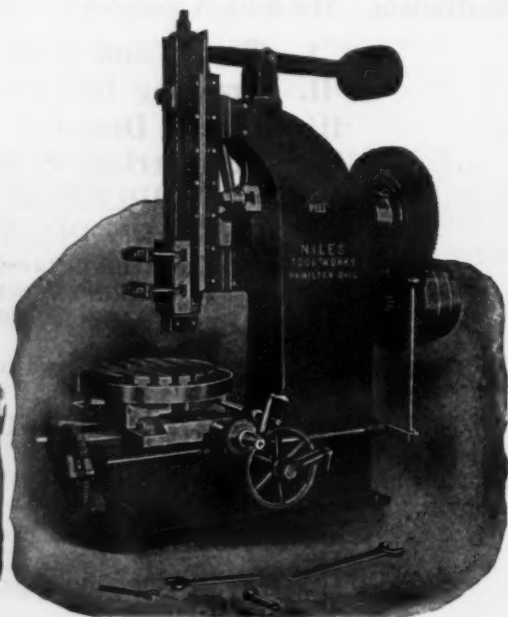
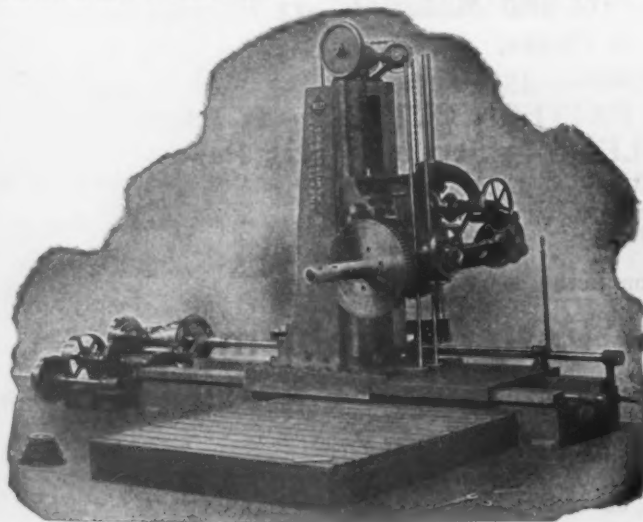
ST. LOUIS—615 North Fourth street.
LONDON, S. W., England—39 Victoria street. (Telegrams, "Niliacus, London.")
SOUTHERN U. S. AGENCY—Shelby Compton, Columbus, Georgia.

AGENCIES:

PARIS—H. Glaesner & Co.
COPENHAGEN—V. Lowener.
HELSINGFORS, Finland—Werner Hult.

12 in. HEAVY CRANK SLOTTING M.C.H.E. No. 5930.

8 ft. x 4 ft. HORIZONTAL BORING, DRILLING AND MILLING M.C.H.E. No. 4738.



SHELBY

C
O
L
D
D
R
A
W
N
S
E
A
M
L
E
S
S

SHELBY COLD DRAWN SEAMLESS STEEL TUBING

Is made from the very best material, there being only one heating (with the exception of annealing) from the original solid form to the finished tubing.

It is impossible to manufacture Cold Drawn Tubing from material containing flaws or physical imperfections, as same would become apparent in either the piercing or cold drawing operation.

The cold drawing renders the tubing very dense, tough and exceedingly ductile. It will stand more abuse before failure than any tubing made. It has a smoother finish and is truer to size and gauge than is possible to obtain in lap-welded tubing.

It is superior to any tubing made for Pneumatic and Steam Rock Diamond Drills, Gas and Steam Engine Cylinders, Bushings, Hydraulic Tubings, Oil Well Working Barrels, Hollow Shaftings, Armature Journals and all mechanical purposes where tubing can be used.

Write for Price List "E" for full information.

Shelby Steel Tube Company,

General Sales Office, American Trust Bldg., Cleveland, O.

BRANCH OFFICES:

Boston,

Julian L. Yale & Co.,

Rookery Bldg., Chicago.

New York,

Chicago, 135 Lake St.

J. J. Lynn,

Port Huron, Mich.

STEEL TUBING

An All Around Machine.

The New No. 5B Becker Vertical Spindle Milling Machine . . .



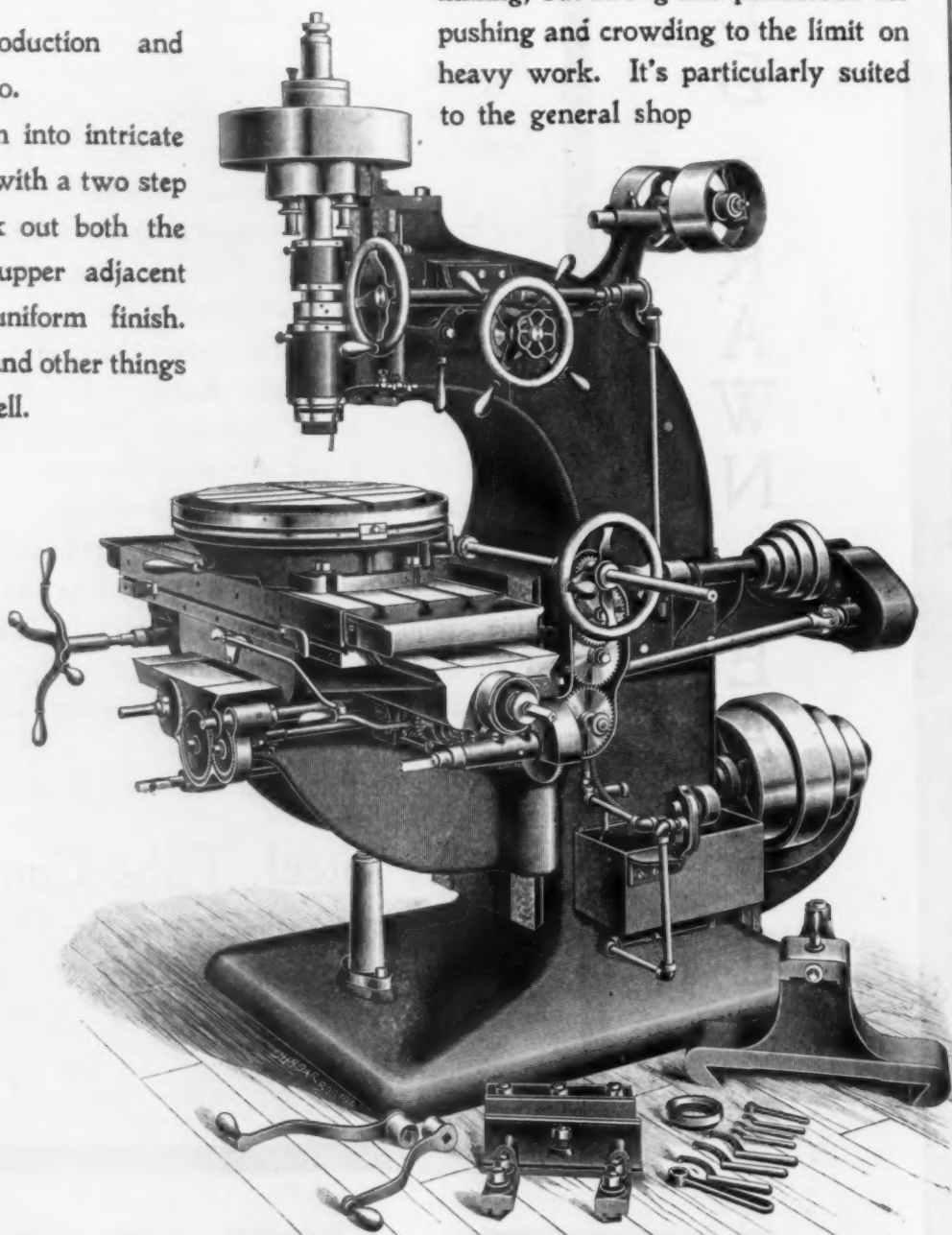
Simplifies production and cuts costs in two.

Will get down into intricate shape work, or with a two step cutter will work out both the recess and the upper adjacent surface to a uniform finish. Will do a thousand other things and do them well.

Patented
Adjustable
Auxiliary
Bearing
Keeps
Spindle
Absolutely
Vertical to
Table.

Built in the
Largest
Milling
Machine
Manufactory
in the
World.

Is a big machine and a little machine in one. Delicate enough for the finest milling, but strong and ponderous for pushing and crowding to the limit on heavy work. It's particularly suited to the general shop

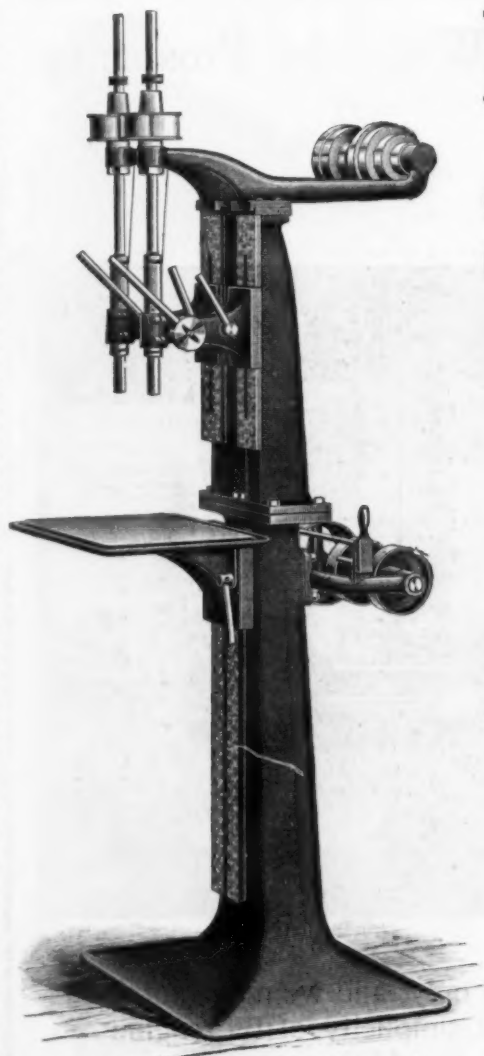


Send for Circular No. 50-7.

BECKER-BRAINARD MILLING MACHINE CO.,

HYDE PARK, MASS., U. S. A.

Multiple Spindle Sensitive Drills.



Beautiful in Design,
Excellent in Workmanship,
Convenient in Operation.

Made with 2, 3, 4 and 6 Spindles.

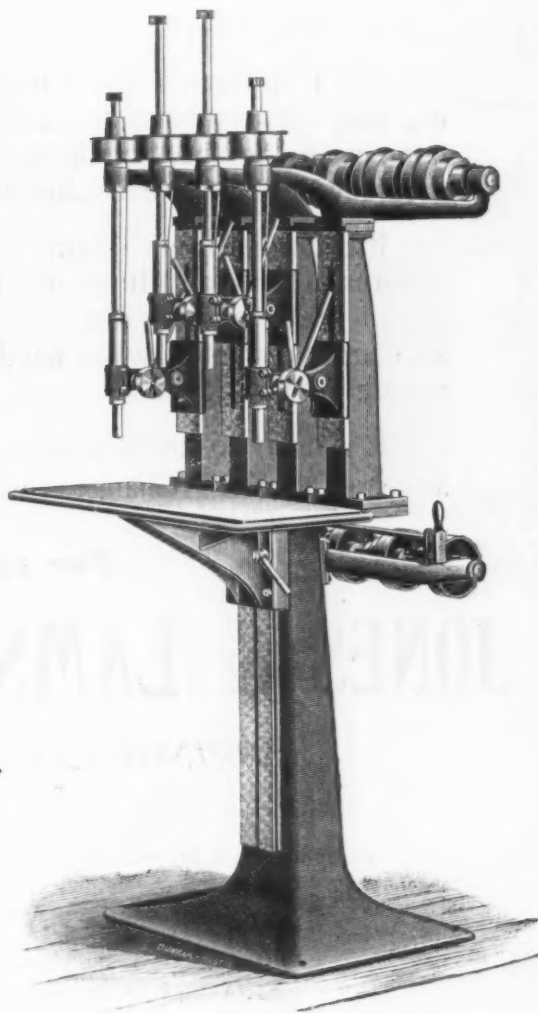
Send for Circular.

IMPROVEMENTS.

Table counterbalanced by weight inside the column.

Spindles counterbalanced by steel cord instead of chain.

Driving pulleys on spindles run on phosphor-bronze bearings.



Hill, Clarke & Co.,

BOSTON, MASS., 156 Oliver St.
CHICAGO, ILL., 14 So. Canal St.
U. S. A.

European Agents:

Chas. Churchill & Co., London, Birmingham, Manchester, Glasgow.
Adolphe Janssens, Paris, France; Brussels, Belgium.
Hans Richter, Berlin, Germany.
W. O. Jensen, Copenhagen, Denmark.
Wossidlo & Co., St Petersburg, Russia.

In Time of Peace Prepare for War. In Prosperity Prepare for Dull Times.

What does your labor cost per year? What is your output?

Remember that the implements in the hands of your workmen determine the relation between the cost of labor to amount of output.

Whether in war or manufacturing the best implements are essential to success.

That there is no Trust or Combination big enough to disregard this fact, no machine shop too small to profit thereby.

If you can afford to use obsolete methods you are rich enough, to buy a Flat Turret Lathe.



The Flat Turret Lathe is made in one size only, and we make nothing else. It combines the convenience and simplicity of the engine lathe with the speed of the turret lathe and in addition possesses an accuracy of working exceeding both under the usual conditions.

It is furnished with complete outfit of Tools, including the Hartness Automatic Die, and turns out nearly every conceivable shape under 2 in. in diameter and 24 in. long when working from full length bars, also larger diameters when handling forgings or pieces that do not pass through the spindle.

It is ready to run as soon as belts are put on and does not require any special tools. Change of work only requires change of adjustment.

For sale only by

JONES & LAMSON MACHINE CO.,

SPRINGFIELD, VERMONT, U. S. A.

—AND—

ENGLISH { JONES & LAMSON MACHINE CO., Exchange Buildings, Stephenson's Place, Birmingham.
OFFICES: { HENRY KELLEY & Co., 26 Pall Mall, Manchester.

OFFICE FOR GERMANY, HOLLAND, BELGIUM, SWITZERLAND, AUSTRIA-HUNGARY AND ITALY: M. KOYEMANN,
Charlottenstrasse, 112, Düsseldorf, Germany.

FRANCE: PH. BONVILLAIN, 6, Rue Blanche, 6, Paris.

SWEDEN: AKTIEBOLAGET VERKTYGSMASKINER, Stockholm.

The Champion Blower & Forge Company's 1900 Catalogue,

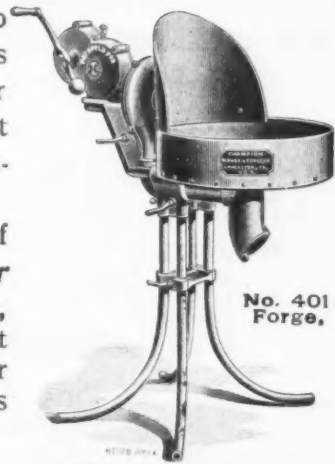
Containing 192 Pages,

is now ready and will be mailed free to all dealers when asked for. It illustrates the largest line of up-to-date tools ever shown in a catalogue, and the largest line ever manufactured under one control.

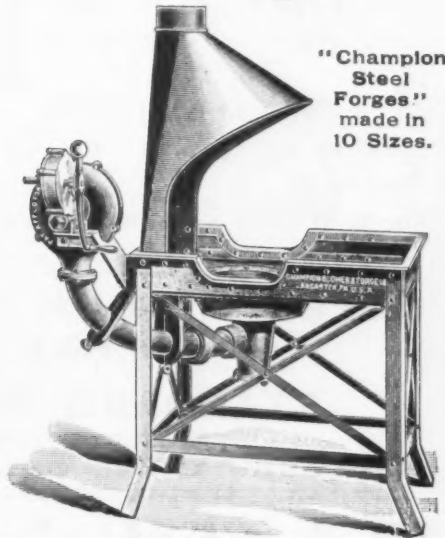
To prove this to be no idle talk, if looking for blacksmith tools, see our 1900 Catalogue, the handsomest and largest ever published in this line in the world



No. 1 Forge.

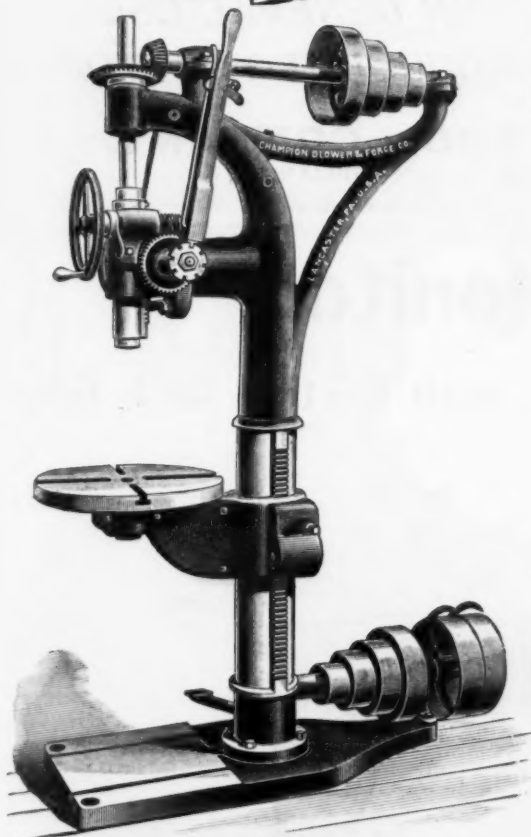


No. 401 Forge.

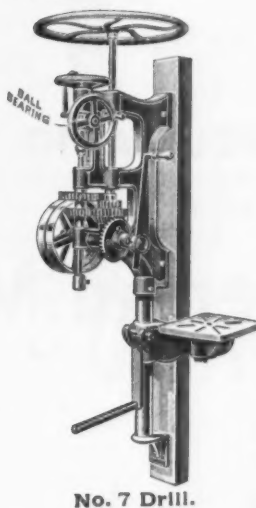


No. 405 Forge.

"Champion Steel Forges" made in 10 Sizes.



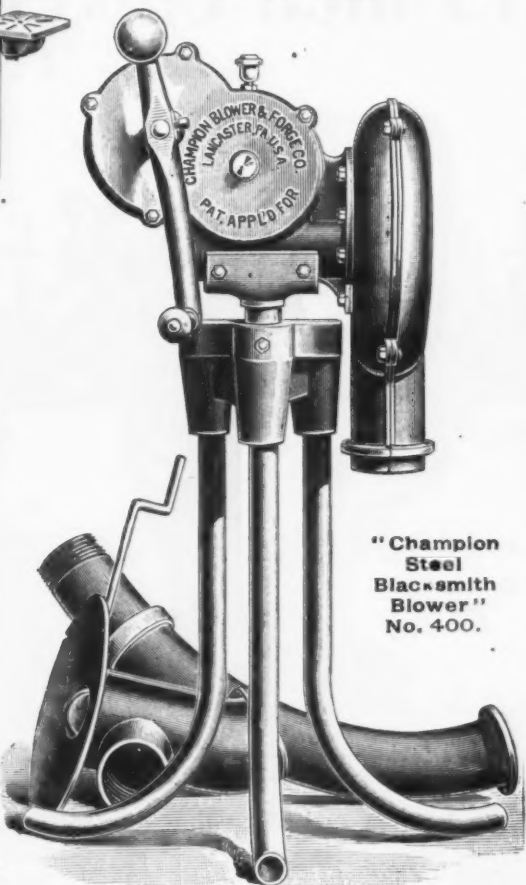
20-inch Upright Power Drill.



No. 7 Drill.



Ball Bearing Drill.



"Champion Steel Blacksmith Blower" No. 400.



PERFECT SCREWS AT A SINGLE CUT

We manufacture the following tools, which will be found in our 1900 Catalogue:

9 different styles of Blacksmith Blowers.	5 different styles of Screw-plates.
72 " " " Forges	Power Blowers and Exhaust Fans in sizes from 8 inches to 8 feet.
22 " " " Blacksmith Drills.	Disc Wheels in sizes from 18 to 84 inches.
10 " " " Tire Benders	
4 " " " Tire Shrinkers.	

In our judgment no buyer of tools can afford to pass seeing our line, as we are prepared to please the most expert critics. For our 1900 Catalogue address

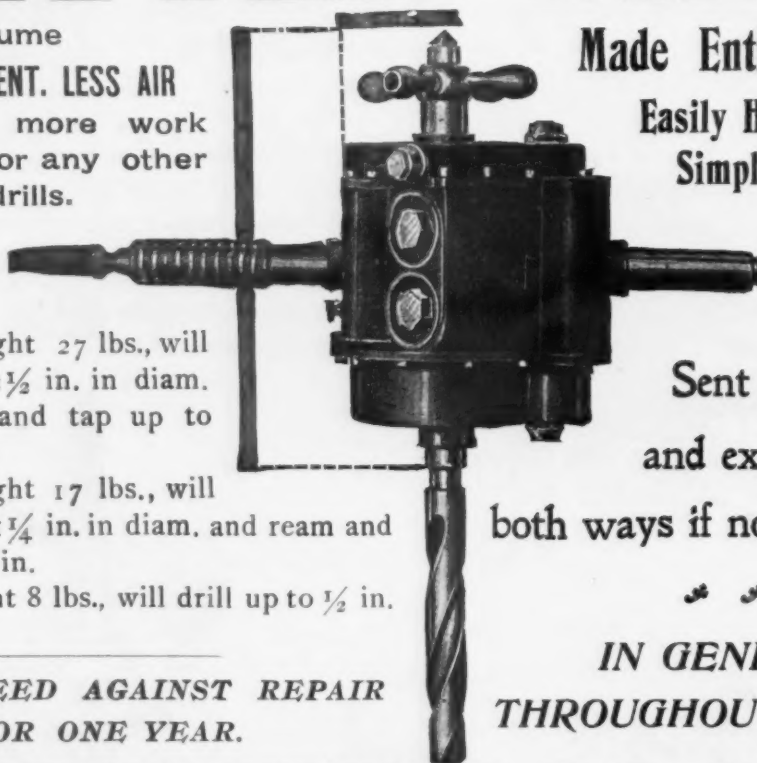
THE CHAMPION BLOWER & FORGE CO., Lancaster, Pa., U. S. A.

THE ONLY PISTON AIR DRILLS MADE

That Have Double-Balanced Piston Valves that Cut Off at 5-8 of the Full Stroke are the

"LITTLE GIANT"

They consume
FIFTY PER CENT. LESS AIR
and do far more work
than rotary or any other
type of air drills.



Made Entirely of Steel.

Easily Handled and Operated.
Simple in Construction.

No. 1. Weight 27 lbs., will
drill up to $2\frac{1}{2}$ in. in diam.
and ream and tap up to
2 in.

No. 2. Weight 17 lbs., will
drill up to $1\frac{1}{4}$ in. in diam. and ream and
tap up to 1 in.

No. 3. Weight 8 lbs., will drill up to $\frac{1}{2}$ in.
in diam.

**GUARANTEED AGAINST REPAIR
FOR ONE YEAR.**

Sent on trial anywhere
and express charges paid
both ways if not satisfactory.



**IN GENERAL USE
THROUGHOUT THE WORLD.**

STANDARD PNEUMATIC TOOL COMPANY,

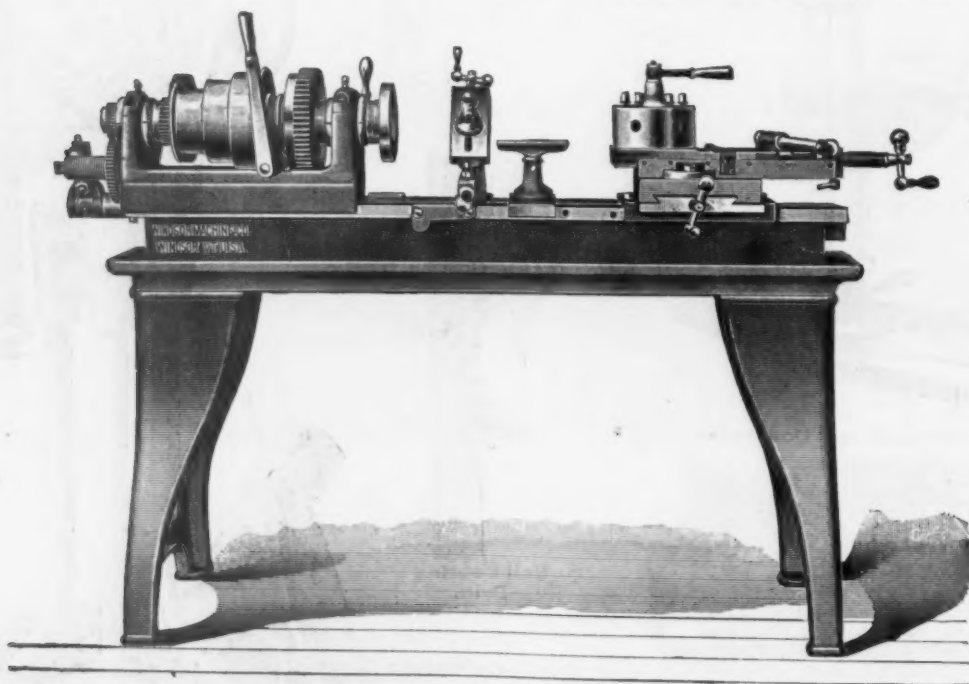
Manufacturers of All Kinds of PNEUMATIC TOOLS AND APPLIANCES,

Marquette Bldg., Chicago.

141 Broadway, New York.

15 inch Universal Monitor

... with Friction Back Gears



We have a complete line of TURRET MACHINERY for working Steel, Cast-iron and Brass.

SEND FOR CATALOGUE.

WINDSOR MACHINE COMPANY, Windsor, Vermont, U. S. A.

The Geometric Line

...OF...

Tools for Screw Machines

is most complete and up-to-date.

We make a special study of this class of tools.

Adjustable Self-Opening Screw Cutting Die Heads

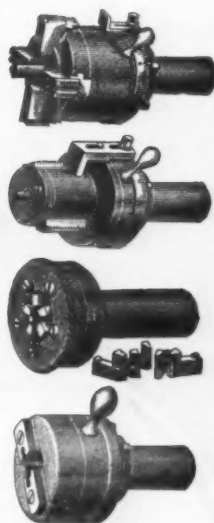
for any size or style of thread ; save 50% over solid dies.

Adjustable Hollow Milling Tools,

various sizes, either for turret use or live spindle.

Adjustable Collapsing Taps,

many sizes and styles for turret or rotary use.



DESCRIPTIVE MATTER ON DEMAND.

Sole Manufacturers and Patentees,

GEOMETRIC DRILL CO., - WESTVILLE, CONN., U. S. A.

J. W. CREGAR, Philadelphia Bourse Exhibition.

European Agents:

CHAR. CHURCHILL & Co., Ltd.,
London and Birmingham,
England.

H. GLAENZER & PERBEAUD,
Paris, France.

DE FRIES & Co.,
Berlin and Dusseldorf,
Germany, and Vienna,
Austria.

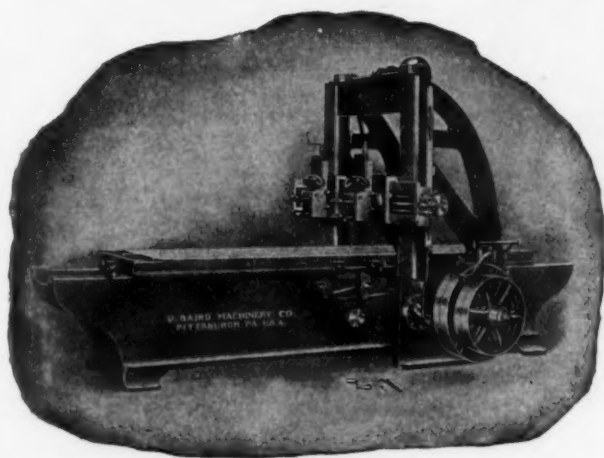
U. BAIRD MACHINERY CO.,

HIGH GRADE LABOR SAVING

MACHINE TOOLS

FROM OUR STOCK FOR

IMMEDIATE DELIVERY.

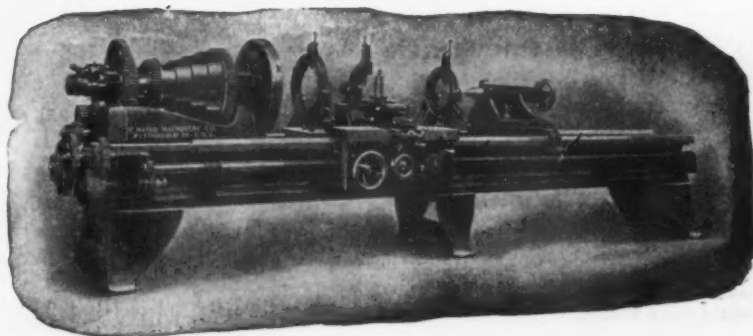


323-325 Water Street,

324-326 First Avenue,

PITTSBURGH,

PENN'A.



OLIVER WOOD TRIMMERS SAVE MONEY ON PATTERNS



Oliver Wood Trimmers save money on patterns. We repeat this statement because there are yet a good many who have not learned by experience the truth of it. If you haven't Oliver Wood Trimmers for the exclusive use of each pattern maker, you are missing a chance to save a large percentage on the cost of your patterns. Think of the amount of time to be saved by having a machine that will instantly trim a rough end of wood as smooth as glass and perfectly accurate at any desired angle. We have been putting Trimmers on the market for a good many years. If yours is one that was purchased some time ago, it will be interesting and profitable for you to investigate the improvements and new styles we have made recently. You had better write for our Oliver Wood Trimmer Book.

Lieber's Code Used. Cable address "Trimmer."



AMERICAN MACHINERY CO. GRAND RAPIDS, MICH.



A light, powerful Rotary Drill for hard service and much abuse. Will ream $1\frac{1}{4}$ in. holes with ease. Try one. We also make Piston Drills, Chipping, Calking and Riveting Hammers, Yoke Riveters, etc.

CATALOGUE FREE.

**Philadelphia Pneumatic
Tool Co.,**

NEW YORK: PHILADELPHIA: PITTSBURGH:
149 Broadway Stephen Girard Wood and Water sta.
Building.

BOSTON: Exchange Building.

Mechanical Movements, powers, devices and appliances used in constructive and operative machinery and the mechanical arts, for the use of inventors, mechanics, engineers, draughtsmen and all others interested in any way in mechanics. By GARDNER D. HISCOX, M. E. Illustrated with 640 engravings, especially made for this book. 8vo, cloth.....\$3.00

For sale by David Williams Co., 232 William St., N.Y.

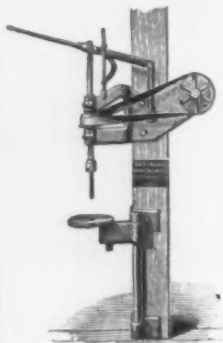
POOLE PATENT STEEL PRESSURE BLOWER

On Adjustable Bed with
Combined Countershaft.



Manufactured and Sold by

J. B. & J. M. CORNELL, {26th St. & 11th Ave.,
NEW YORK CITY.



No 1
Portable Boring Machine.

ESTABLISHED 1850.

Defiance Machine Works,

DEFIANCE, OHIO, U. S. A.,

INVENTORS AND BUILDERS OF

Patent Wood-Working Machinery

FOR MAKING

**Hubs, Spokes, Wheels, Wagons, Carriages,
Rims, Shafts, Poles, Neck-Yokes, Single-
Trees, Barrel Hoops, and Handles.**

EUROPEAN OFFICE, 16 Eldon Street, LONDON, E. C., ENGLAND.

THIS ENGRAVING represents our No. 1 Post Boring Machine. The Boring Spindle is 1 3/16 in. diameter and is fitted with a universal chuck to receive bits with 1/2 in. shank and under.

E. W. BLISS CO.

11 ADAMS ST., BROOKLYN, N. Y.

BRANCHES:

WESTERN OFFICE: 22 S. Canal Street, Chicago, Illinois.
 EUROPEAN OFFICE: 12 Ave. De La Grande Armée, Paris, France.
 LONDON AGENCY: The Projectile Co., Ltd., New Road, Wandsworth Road, S. W.
 BERLIN AGENCY:
 VIENNA "
 COLOGNE "
 STOCKHOLM "
 ST. PETERSBURG AGENCY: Schuchardt & Schütte.

DESIGNERS AND BUILDERS OF

Power Presses

AND MANY OTHER SHEET METAL WORKING TOOLS.

"Bliss" Straight-sided Power Presses, No 73½ to 76½.

These Presses are specially designed for trimming drop forgings, either hot or cold, but are equally well suited for punching, piercing, shaping, or stamping heavy blanks in the manufacture of electrical instruments, sewing-machines, typewriters, cash registers, cutlery, hinges, skates, and many bicycle parts, such as sprockets, hubs, flanges, and all styles of sheet metal connections.

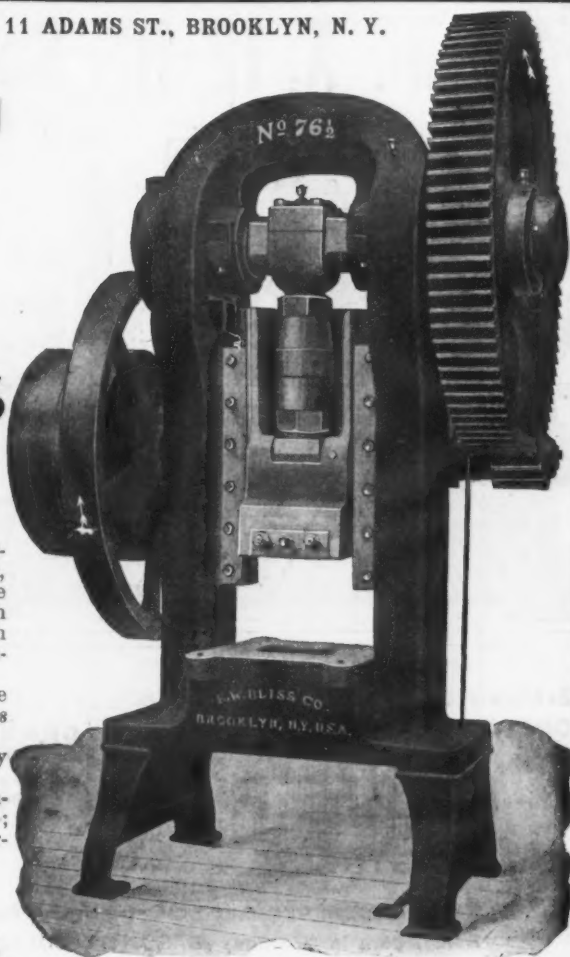
The Slides are made of unusual width and length and are supported in the gibs their entire length when die is doing its work, thus insuring better work and increased life of the tools.

The right and left hand screw connection is made very heavy and is steel, with shaft bearing bronze bushed.

The Crank Shafts are forged steel and of very large diameters: No. 73½, 4 inches; No. 74½, 5 inches; No. 75½, 6 inches; No. 76½, 7 inches, the frames and other parts of press being correspondingly heavy. Write for further particulars.

Also Owners of

THE STILES AND PARKER PRESS CO.



"Bliss" No. 76½ Geared Power Press.

MULTIPLE DRILL.

MADE IN 5 SIZES.

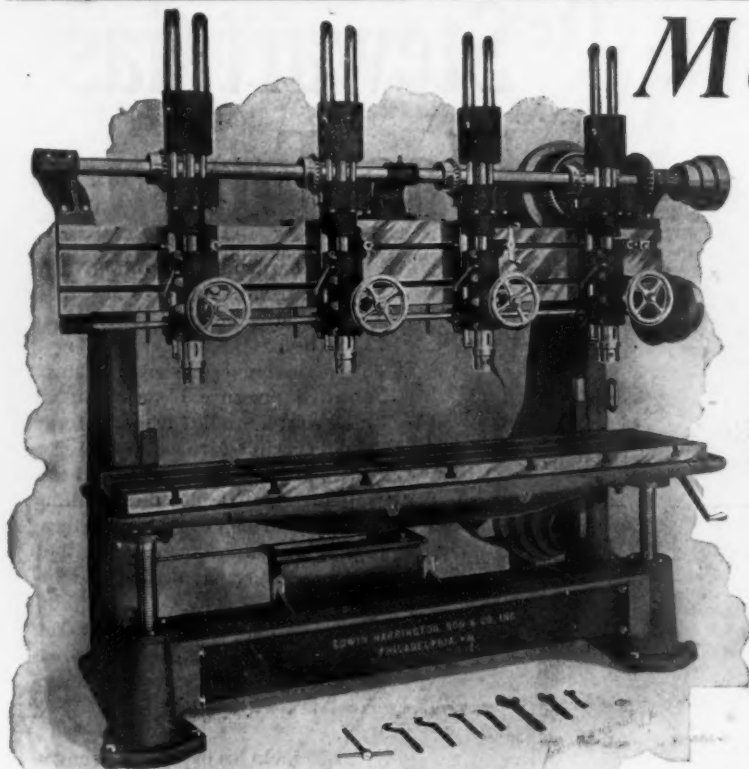
DRILLS A NUMBER OF HOLES AT ONCE.

SPINDLES HAVE INDEPENDENT LATERAL ADJUSTMENT ON CROSS HEAD, AND ONE OR MORE MAY BE USED AT THE SAME TIME, EACH SPINDLE IS COUNTERBALANCED, QUICK RETURN, AND FEED STOPPED AUTOMATICALLY.

TABLE RAISED AND LOWERED BY SPIRAL GEARS AND SHAFT.

Immediate Deliveries from Stock.

Write for Further Details.

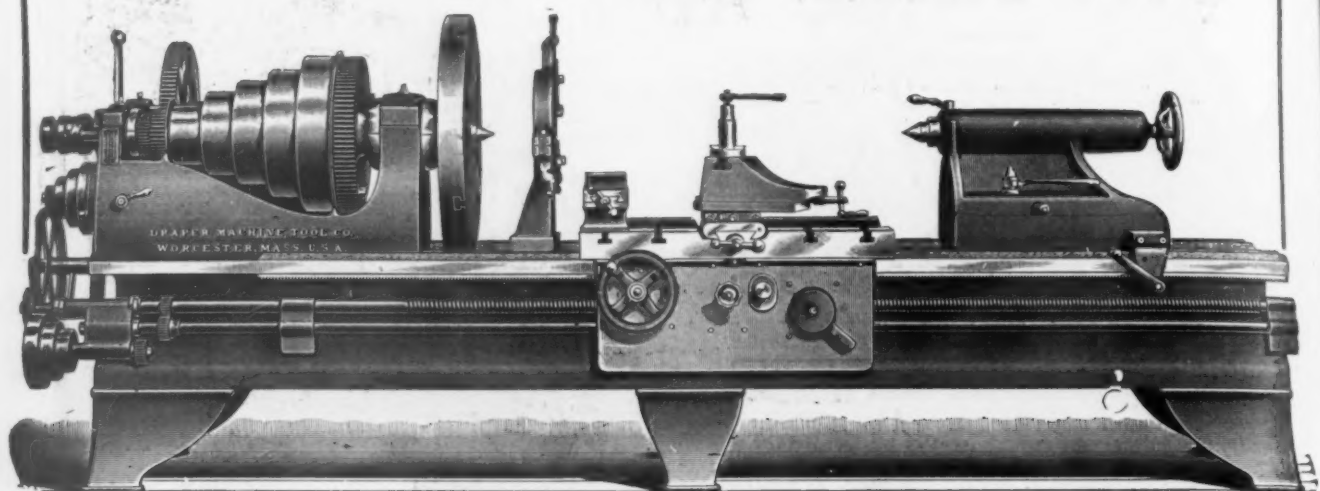


EDWIN HARRINGTON, SON & CO., Inc.,

Machine Tools, Hoists, Overhead Tramway, Gear Cutting,

PHILADELPHIA, PA., U. S. A.

30 in. X 12 ft. Screw Cutting Lathe.



72-Inch HORIZONTAL BORING MILL.
SCREW MACHINES.

CRANK PLANERS.

SCREW CUTTING LATHES.
HAND LATHES.

DRAPER MACHINE TOOL CO.,

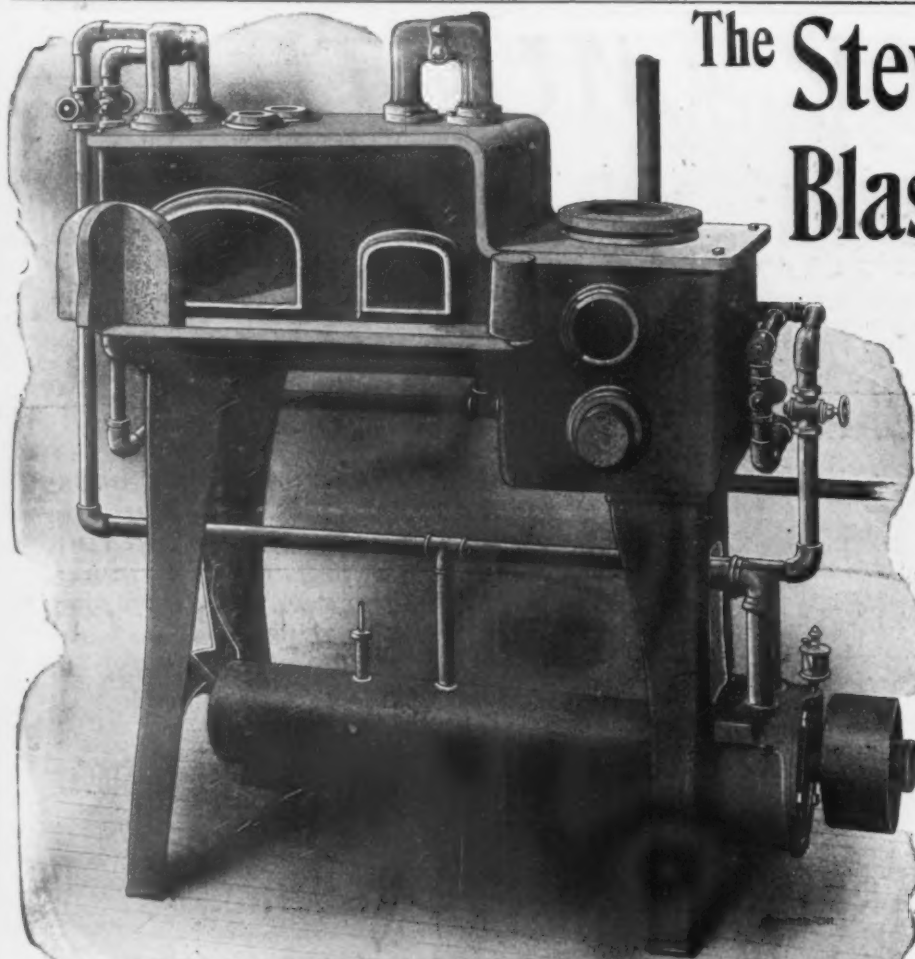
140 GOLD STREET,

WORCESTER, MASS.

Sole European Agents—SELIG-SONNENTHAL & CO., 85 Queen Victoria St., London.

Sole Agent in Germany—E. SONNENTHAL, Junr., Berlin, Neue Promenade 5.

The Stewart Gas Blast Furnace



For hardening, annealing, tempering, forging, etc.

Especially adapted for machine shop use.

Combining on one base: a rotary positive pressure blower; an air reservoir; a muffle furnace; a forge and a crucible furnace.

A complete equipment for heating all small tools, dies, milling cutters, drills, taps, reamers, springs, machine parts, etc., either for hardening, annealing or tempering.

Can be placed anywhere in the shop that is convenient. Does not need to be connected to chimney. Heat is always under perfect control.

Price includes everything shown in cut, ready to connect to gas supply pipe and blower belted to power. Catalog on application.

CHICAGO FLEXIBLE

—SHAFT CO.,

158-160 Huron St.,

CHICAGO.



AGENTS,
PURCHASING AGENTS AND
MANUFACTURERS,
IF YOU HAVE NOT RECEIVED OUR
CARDS FOR YOUR INDEX, SEND
US YOUR ADDRESS.

BORING AND TURNING MILLS.

87-IN. 51-IN. 31-IN.

BAUSH & HARRIS MACHINE TOOL CO.,
SPRINGFIELD, MASS.

American Agents: { MANNING, MAXWELL & MOORE,
New York; Chicago; Pittsburg; Cleveland.
HILL, CLARKE & CO.,
Boston.

European Agents: { SELIG SONNENTHAL & CO.,
London.
E. SONNENTHAL, Jr.,
Berlin.

GALVANIZED STEEL SHEETS

Corrugated Sheets, Galvanized or Painted

BLACK STEEL AND IRON SHEETS
ROOFING AND SIDING

McCULLOUGH IRON CO., Wilmington, Delaware.

THE METALLURGY OF IRON.

By THOMAS TURNER,

Associate of the Royal School of Mines; Fellow of the Institute of Chemistry; Director of Technical
Instruction to the Staffordshire County Council.

Being one of a Series of Treatises on Metallurgy written by Associates of
the Royal School of Mines.

EDITED BY PROF. W. C. ROBERTS-AUSTEN, C.B., F.R.S.

Illustrated by Eighty Engravings. In One Volume, 8vo, 367 Pages, Cloth. Price, \$5.00.

8s at, post-paid, upon receipt of price by DAVID WILLIAMS CO., Publishers and Booksellers, 232 William St., N. Y.

Prentice Bros. Company,

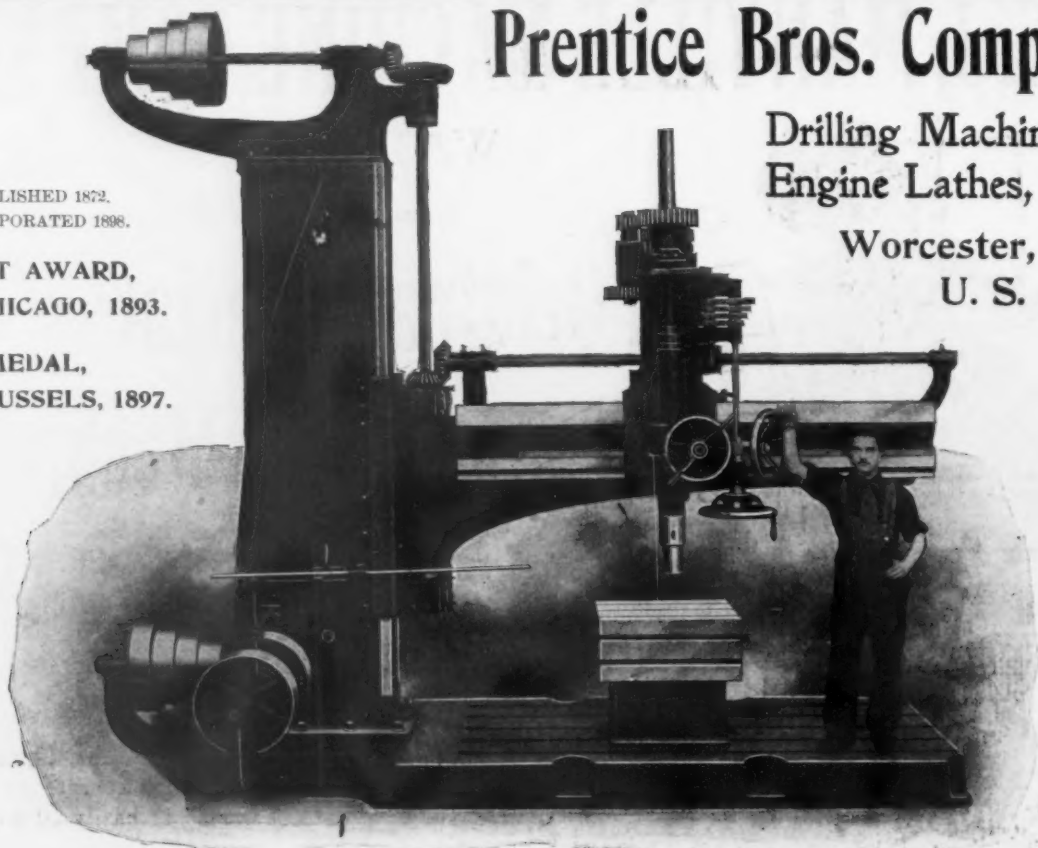
Drilling Machines and
Engine Lathes,

Worcester, Mass.,
U. S. A.

ESTABLISHED 1872.
INCORPORATED 1898.

HIGHEST AWARD,
CHICAGO, 1893.

GOLD MEDAL,
BRUSSELS, 1897.



AGENCIES:

SCHUCHARDT & SCHUTTE,
59-61 Spandauerstrasse,
Berlin, Germany.

SCHUCHARDT & SCHUTTE
Breitgasse 17,
Vienna, Austria.

SCHUCHARDT & SCHUTTE,
Rue du Fosse aux Loups, 17,
Brussels, Belgium.

ADPHE. JANSSENS,
16 Place de la Republique,
Paris, France.

CHAS. CHURCHILL & CO., Ltd.,
9 to 15 Leonard St.,
London, E. C., England.

W. BAIRD MACHINERY CO.,
Pittsburg, Pa.

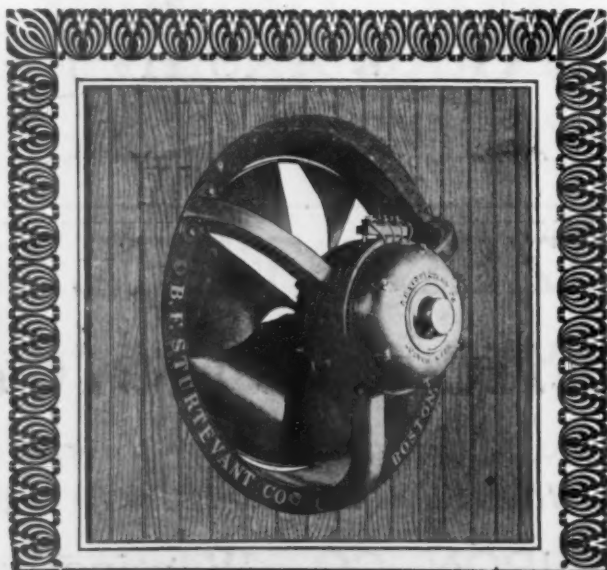
FAIRBANKS CO.,
Philadelphia, Pa.

O. L. PACKARD MCH. CO.,
Milwaukee, Wis.

PRATT & WHITNEY CO., Chicago, Ill.

C. C. WORMER MACH'Y CO.,
Detroit, Mich.

W. R. COLCORD MACH'Y CO.,
St. Louis, Mo.



ELECTRIC VENTILATING FANS

Dust Proof Motor. Shipped Ready for Operation

CARRIED IN STOCK

Send for Bulletin Q.

B. F. STURTEVANT CO., Boston

New York Philadelphia Chicago London

THE E. J. MANVILLE MACHINE COMPANY,

WATERBURY, CONN.

Inventors, Designers and Builders of

Original, Special and Automatic Machinery

FOR ANY PURPOSE.

SPECIAL.—The illustration shows our perfected **NIPPLE MACHINE**, of which there are more than forty now in use.

It automatically Feeds, Drills, Taps, Squares and Points previously headed blanks at rate of 25 per minute, and does perfect work. Is easily adjusted and operated.

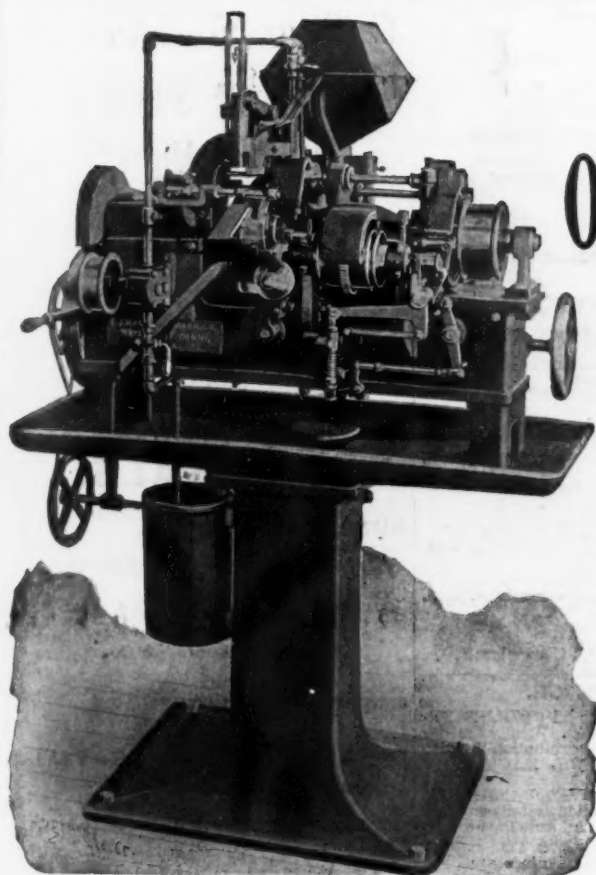
Write us for particulars.

CATALOGUES—

A—Wire Forming Machines.

B—Power and Foot Presses with attachments.

C—Rivet or Wire Heading Machines.



(PATENTED NOV. 20, 1897.)
AUTOMATIC BICYCLE NIPPLE MACHINE.

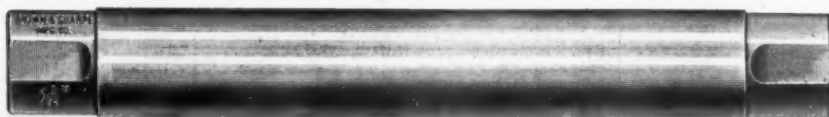
Brown & Sharpe Mfg. Co.,

PROVIDENCE, R. I., U. S. A.

Machinery and Tools.

Lathe Mandrels.

THESE MANDRELS ARE OF TOOL STEEL, HARDENED, AND ACCURATELY GROUND TO A UNIFORM TAPER.



They are tapered .0005 in. to one inch.

Those from 1-4 in. to 11-16 in. are .0005 in. below size at the small end; and from 3-4 in. to 2 in., .001 in. below size at small end.

Sizes from 1-4 in. to 2 in., varying by 1-16 in., carried in stock.

Catalog, illustrating and describing full lines of our Machines and Tools, mailed to any address upon application.

2^D-HAND MACHINERY.

Immediate Delivery. Low Prices.

LATHES.

15 in. x 6 ft. Blaisdell.
14 in. x 6 ft. Flather.
14 in. x 6 ft. Lodge-Davis.
16 in. x 8 ft. Blaisdell.
16 in. x 6 ft. Reed.
18 in. x 6 ft. Lodge-Davis.
18 in. x 8 ft. Lathe-Morse.
18 in. x 14 ft. Ames.
20 in. x 8 ft. Reed.
21 in. x 10 ft. Perkins.
22 in. x 14 ft. Sellers.
24 in. x 10 ft. Wright.
24 in. x 12 ft. Perkins.
26 in. x 12 ft. Wright.
26 in. x 22 ft. New Haven.
32 in. x 18 ft. Waterman.
36 in. x 15 ft. New Haven.
40 in. x 18 ft. Perkins.
50 in. Niles Pulley Lathe.
Pit Lathe, 8 ft. face-plate.

UPRIGHT DRILLS
20 in. Barnes hand feed.
20 in. Prentice, auto. feed.
25 in. Barnes complete.
25 in. Prentice complete.
26 in. Barnes complete.
Gang Drills, 2, 3, 4 spindles

RADIAL DRILLS.

3 ft. arm Bement.
3 ft. arm Gang Co.'s.
4½ ft. arm. Latest pattern
5 ft. arm Niles.

MILLING MACHS.

Hand, No. 2, Pratt-Whit.
Auto. feed, several sizes.
Universal No. 1 Brown-
Sharpe.
Vertical style, large size

SCREW MACHS.

Wire feed, several sizes.
Full auto., 23-16 in. Hart-
ford.

PLANERS.

24 in. x 6 ft. Gray.

26 in. x 8 ft. New Haven.
28 in. x 7 ft. New Haven.
30 in. x 7 ft. New Haven.
30 in. x 8 ft. Gleason, 2 hds.
30 in. x 10 ft. Gleason.
30 in. x 12 ft. Open-side.
32 in. x 10 ft. Pond, 2 hds.
35 in. x 12 ft. Pond, 2 hds.
36 in. x 16 ft. Betts.
42 in. x 14 ft. Gleason.
48 in. x 8 ft. Hewes-Phil.
60 in. x 10 ft. Pond, side-
head.
72 in. x 8 ft. Pond, 2 hds.

SHAPERS.

8 in. Pratt-Whitney.
10 in. crank, New Haven.
14 in. Trav. hd., Fitchburg.
15 in. friction, Hendey.
16 in. crank, Kelly.

UPRIGHT BORING MILLS.

60 in. Sellers, dble. head.
42 in. Light, single head.
38 in. Pulley Borer.

HOR. BOR. MILLS.

Newark "C" 3-in. spindle
5 ft. table, facing hd.,
etc.

BOILER TOOLS.

Rolls, 8, 10½ and 11 ft.
Punches, 12, 30 and 36 in.
gap.

Double Punch and Shears.
Plate Planer, 16 ft.
Hyd. Riveter, 8 ft. gap.

STEAM HAMMERS.

330 lbs. Ferris & Miles.
400 and 600 lb. Morgan.

MISCELLANEOUS.

36 in. Auto. Gear Cutter.
Drop Hammers, 850-1250
lbs.
Presses, Stiles and Bliss.

J. J. McCABE,
14 Day St., New York.

FOR SALE—ENGINES.

28 in. x 60 in. Allis Corliss.
26 in. x 48 in. George H. Corliss.
24 in. x 44 in. x 48 in. Cross Compound Corliss.
24 in. x 48 in. Allis Corliss.
23 in. x 36 in. George H. Corliss.
22 in. x 48 in. Hamilton Corliss.
22 in. x 42 in. Wright four-valve automatic.
20 in. x 48 in. Wheelock Corliss.
20 in. x 42 in. Putnam four-valve automatic.
18 in. x 48 in. Wright four-valve automatic.
18 in. x 20 in. Porter-Allen automatic.
16 in. x 16 in. Cooper high speed automatic.
16 in. x 16 in. Green high speed automatic.
15½ in. x 28 in. x 16 in. A. & S. Cross Cpd. auto.
14½ in. x 15 in. Armstrong & Sims automatic.
12 in. x 36 in. Atlas Corliss.
12 in. x 33 in. Putnam four valve automatic.
12 in. x 12 in. Phoenix High speed automatic.
11 in. x 16 in. Allen high speed automatic.
10 in. x 20 in. George H. Corliss.
10 in. x 16 in. Wright & Adams high speed auto.
10 in. x 12 in. N. Y. Safety high speed automatic.
Send for complete list.

WICKES BROS., Saginaw, Mich

28 in. Pulley Turning and Boring Machine with two tools and boring attachment; for straight and taper facer with power feeds in all directions. Very heavy and in fine condition.

HENRY F. HILL,
103 Oliver Street, Boston, Mass.

ENGINE BARGAINS.

1 22 x 40 x 48 Cross Compound Wright, with Condenser Complete.
1 18 x 42 Eclipse "Erick" Corliss.
1 14 x 32 Watts-Campbell.

DYNAMOS.

3 100 K. W. Gen'l Electric direct connected, used at the Waldorf-Astoria Hotel, New York.
1 25 K. W. Edison.
2 20 K. W. Edison.
Large assortment of Dynamos and Pumps.
JOHN E. BEGGS, 47 Cedar St., New York.

FOR SALE.

Second-hand Steam Engines, Boilers and Pumps. Large variety of sizes and makers.
F. McSWEGAN & SONS,
Dover St. and Franklin Sq., New York.

FOR SALE.

25 Tanks, assorted, 600 to 1000 gallons.
11 Cylinder Boilers, 36 in. x 40¼ ea., 100 lbs. pres.
One 24 in. F. F. Chase Shaper.
One 22 in. Prentiss Shaper.
One 15 in. Wright Shaper.
One 14 in. Wm. Sellers & Co. Traverse Head Shaper.
One 500 lb. Merrill Drop Hammer.
One 18 in. x 36 in. "Watts-Campbell" Hor. left handed Corliss Engine.
One 12 in. x 28 in. "Watts-Campbell" right handed Corliss Hor. Engine
Two 60 in. Wm. Sellers & Co. Vertical Boring Mills with two heads.

L. F. SEYFERT'S SONS,
437-441 N. 3d St., Philadelphia, Pa.

FOR SALE.

1 16 x 8 Springfield Lathe, compd. rest, tap. attachment, two chucks fitted.
1 17 x 6 Muller Lathe, compound rest.
1 17 x 6 Muller Lathe, plain rest.
1 16 x 6 Lodge & Shipley, cpd. rest, tap. att.
6 14 x 6 Feather Lathes, plain rest.
2 14 x 6 Reed Lathes, elevating rest.
1 14 x 6 Springfield Lathe, cpd. rest, tap. att.
3 24 in. Aurora Drills, back geared, power feed, auto. stop.
2 20 in. Barnes Sq. Base Lever Feed
1 24 in. Gould & Eberhardt Crank Shaper.
1 22 in. Walcott Geared Shaper.
1 No. 2 Cincinnati plain back geared Miller.
1 No. 4 Kempamith plain back geared Miller with index head.
1 No. 0 Lodge & Davis Plain Miller.
1 No. 4 Warner & Swasey Screw Machine, auto. chuck, wire feed.
1 P4 Ferracute Power Press.

S. M. YORK CO., Cleveland, O.

SPECIAL NOTICE.

One first-class 350 H. P. Left-hand CORLISS ENGINE, thoroughly overhauled. Ready for immediate delivery. Suitable for rolling mill work. Large quantity ROLLING MILL MACHINERY in stock.
A number of good LOCOMOTIVES, PASSENGER and COMBINATION CARS, all in first-class order. Above will be sold very low. Address the owners,
POULTER & CO.,
410 Bullitt Building, Philadelphia, Pa.

NEW AND SECOND-HAND MACHINERY, LARGEST ASSORTMENT.

NEW MACHINES FOR IMMEDIATE DELIVERY.
Erie Engine Works, Plain Slide Valve, Automatic and Portable Engines, all sizes.
Rahn Lathes, Turrets, Planers and Shapers.
Aurora Drill Presses.
Beddy Steam Pumps and Air Compressors.
Centrifugal Pumps and Dredging Machines.
Hoisting Engines and Contractors' Outfits.

SECOND-HAND MACHINERY IN STOCK.

1 28 in. x 45 in. Corliss Engine.
1 26 in. x 60 in. " "
1 22 in. x 42 in. Putnam " "
1 16 in. x 42 in. Harris Corliss Engine.
1 14 in. x 28 in. Phila. " "
1 12 in. x 24 in. Buckeye Engine.
1 18 in. x 24 in. Porter & Hamilton Heavy Slide Valve Engine.
1 14 in. x 24 in. x 11 in. Westinghouse Comp'd Engine.
1 18 in. x 30 in. x 16 in. " "
50 to 300 H. P. High speed Automatic Engine.
40, 60, 80 and 100 H. P. Horizontal Boilers.
20, 25, 30 and 75 H. P. Locomotive Boilers.
5 to 50 H. P. Vertical Boilers.
50 H. P. Babcock and Wilcox Boiler.
Large stock of Steam and Centrifugal Pumps, Lathes, Planers, Shapers, Drills, Milling Machines, Radial Drills, Punches, Shears, Dynamos and Motors, Etc.
FRANK TOOMEY, No. 129-131 N. Third St., Phila.
L. D. Telephone 262.

BARGAINS.

34 in. x 60 in. Corliss Engine.
18 in. x 42 in. " "
12 in. x 36 in. " "
12 in. x 30 in. " "
17 in. x 18 in. Armstrong & Sims Engine.
16 in. x 24 in. Penna. Iron Works Engine.
14 in. x 20 in. Atlas Side Crank " "
12 in. x 15 in. Supplee " "
10 in. x 20 in. Horiz. Side " "
10 in. x 12 in. Atlas Automatic " "
8 in. x 14 in. Lebanon Horizontal " "
8 in. x 12 in. Side Crank Horizontal " "
6½ in. x 8½ in. Progress Auto. Cut-off Engine.
8 in. x 10 in. Cox Vertical Engine.
7 in. x 9 in. N. Y. Safety Vertical Engine.
6 in. x 8 in. Vertical Engine
15 H. P. Shapley Engine and Boiler.
10 H. P. Climax Engine.
6 x 10 H. P. Baxter Engine and Boiler.
20 in. x 10 ft. Place Lathe, 16 in. x 6 ft. Porter Lathe.
16 in. x 7 ft. Engine Lathe.
20 in. Drill Presses.
7 ft. x 30 in. Band Wheel.
8 ft. x 16 in. Band Wheel.
Vertical Boilers 8 to 50 H. P., second-hand.
54 in. x 16 ft., 60 in. x 16 ft., 66 in. x 16 ft. and 72 in. x 16 ft. Horizontal Boilers.
Large stock of New Engines, Boilers, Machine Tools, etc.
LOVEGROVE & CO., Phila., Pa.

WANTED.

2d-Hand Lathe, 18 or 12 ft. bed, to swing about 30 in. Must be cheap and in good condition.
PLATTSBURGH FOUNDRY & MACHINE CO.,
Plattsburgh, N. Y.

New and Second-Hand Machine Tools.

Harrington Suspension Drill No. 1.

USED ONLY THREE MONTHS.

The Lodge & Shipley Machine Tool Co.,

Cincinnati, Ohio, U. S. A.

FOR SALE.

SUSPENSION DRILL,

Made by the Gleason Tool Co.

36 IN. x 36 IN. x 9 FT. IRON PLANER,

Made by Wheeler & Co.

GISHOLT TOOL GRINDER.

6 TON ELECTRIC TRAVELING CRANE, 25 ft. span,

Made by Yale & Towne.

5 FT. RADIAL DRILL,

Made by Universal Radial Drill Co.

ONE 37 IN. BORING MILL,

Made by the Baush & Harris Machine Tool Co.

All First-class Condition.

HILL, CLARKE & CO.,

156 Oliver St., Boston.

We have a large stock of new tools.

SECOND-HAND MACHINERY.

1 62 in. x 60 in. x 22 ft. Planer.
1 36 in. x 36 in. x 3 ft. Pond Planer.
1 36 in. x 22 ft. triple geared Lathe.
1 38 in. x 12 ft. " "
1 30 in. x 18 ft. New Haven Lathe.
1 18 in. x 8 ft. Wheeler Lathe, with chuck.
1 26 in. x 14 ft. Blaisdell Lathe.
1 22 in. x 18 ft. Pond Lathe.
1 12 in. Crank Shaper, Cheap.
1 6 H. P. Portable Engine and Boiler.
1 14 in. x 42 in. Morgan Steam Hammer.
1 24 in. x 42 Four ton Steam Hammer.
1 Pair Alligator Shears, 12 in. cutters, cut 3¼ in.
1 Plate Planer, planes 18 ft. long.
1 800 lbs. Merrill Drop.
1 600 lbs. " "
1 25 lbs. Bradley Helve Hammer.
1 Combined Punch and Shear, cuts and punches ¼ in.

NEW YORK MACHINERY DEPOT,

Office, 179 Broadway, N. Y.

FOR SALE.

One pair reversing Blooming Mill Engines, built by Mackintosh, Hemphill & Co. Cylinders, 28 in. x 48 in., with extra heavy counter shaft and steel gear wheels.

One pair Reversing Engines. Cylinders, 24 in. x 26 in., with counter shaft and gear wheels, all complete.

One vertical Blowing Engine, built by Welmer Machine Co. Steam cylinder, 25 in.; air, 54 in.; stroke, 30 in.

Apply to

OLIVER IRON AND STEEL CO.,
Pittsburgh, Pa.

**SECOND-HAND
MACHINERY.****ENGINE LATHES.**

112 in. x 4 ft. Pond, R. & F.
112 in. x 5 ft. Young, plain.
112 in. x 6 ft. Blaisdell, R.
114 in. x 5 ft. Putnam R.
114 in. x 7 ft. 6 in. Putnam
R. & F. W. C.
114 in. x 8 ft. Porter R. & F.
114 in. x 5 ft. Robbins, R.
218 in. x 6 ft. Ames, spe-
cial features.
218 in. x 6 ft. Fuller, R. &
F.
218 in. x 8 ft. Fuller, R. &
F.
118 in. x 8 ft. Fitchburg
comp. rest.
120 in. x 14 ft. Chamber-
lain, "old style."
121 in. x 10 ft. White,
taper, "old style."
127 in. x 10 ft. D. W. Pond,
comp. rest.
128 in. x 12 ft. W. L. & Co.,
comp. rest.
127 in. x 12 ft. W. L. & Co.,
plain back gear turning.
128 in. x 16 ft. Ditto.
136 in. x 16 ft. back gear
turning.
140 in. x 16 ft. plain turn-
ing.

SPEED LATHES.

212 in. x 5 ft. B. G. Speed.
111 in. x 4 ft.
120 in. B. G. Speed.
122 in. x 9 ft. B. G. Speed.

PLANERS.

117 in. x 17 in. x 3 ft. Putnam
224 in. x 24 in. x 4 ft. W.
& L.
28 in. x 28 in. x 8 ft. Gay
& Silver.
120 in. x 30 in. x 6 ft.
Walton.
136 in. x 36 in. x 9 ft. New
Haven.

PRESES.

1 No. 5 C. & M. Single.
1 No. 14 Stiles, heavy spe-
cial.
1 No. 5 Blake & Johnson
arch.
1 No. 82 S. & F. Foot.

GRINDERS.

1 Die & Surface.
1 2 Wheel L. & F. Water
Tool Grinder.
1 P. & W. Cam Cutter.

SHAPERS.

124 in. Prentice, B. G. & P. F.
1 34 in. Harris, B. G.
1 36 in. W. & L. "Gap."
1 Pond Suspension.
1 6-spindle Quint.
1 5-spindle Hendey.
1 2-spindle D. Slate 14 in.
1 Bicycle Rim Drill.
1 Milliken Bench.

MILLING MACHS.

1 P. & W. Grant pattern,
Ames Hand.

**SCREW AND
CHUCKING MACHS.**

119 in. x 6 ft. B. M. T. Co.,
Bk. G. and P. F. to tur-
ret, also tools.
1 20 in. x 6 ft. P. & W.
chucking, B. G. & P. F.
turret.
1 No. 2 Costello Screw Ma-
chine with W. F. and
tools.
1 No. 4 Pfaff Windsor,
S. M.
1 P. & W. Screw Machine,
No. 2.

MISCELLANEOUS.

1 5 H. P. Westinghouse
Motor.
1 3 H. P. Elect. Motor.
1 No. 2 P. & A. Cylinder
Borer.
1 No. 48 Green River Bolt
Cutter.
1 Double Head Nut Tap-
per.
1 Morgan Hyd. Riveter.
1 Heavy Broaching Ma-
chine.
2 Oil Separators.
2 Brazing Forges.

Two 20-Ton Hand Traveling Cranes,

58 ft. 10 in. Span.

Large Stock New Machines. Prices on application.

The Niles Tool Works Co.,

138-138 Liberty St., New York.

Special Bargains.**Second-hand Tools.**

1800 lb. Morgan Steam Drop Hammer.
1800 lb. Merrill Drop Hammer Board lift.
1 21 in. Gisholt Turret Lathe with taper attach-
ment and power cross feed.
1 24 in. Morton Key Seating Machine.
1 2-spindle Hilles & Jones Plate Drill.
150 in. x 30 ft. Fifield Triple Geared Lathe.
178 in. x 18 ft. Triple Geared Lathe, rod feed only.
148 in. x 48 in. x 12 ft. Niles Planer, single head.
1 Axle Lathe.
148 in. 150-ton Hydrostatic Wheel Press.
1 36 in. x 16 ft. Bradford Engine Lathe, new.
1 32 in. x 16 ft. Walcott Engine Lathe, new.

Complete stock of both new and second-hand
machinery. Write us for what you want.

McDOWELL, STOCKER & CO.,

59-61 So. Canal St., Chicago.

FOR SALE.

One piece of two inch diameter
Pliable Steel Hoisting Rope, never
been used, at a bargain.

The Thomas Laughlin Company,

PORTLAND, MAINE.

FOR SALE.—Investigate.

36 in. x 36 in. x 12 ft. Iron Planer, new.
40 in. x 17 ft. Engine Lathe, gear screw feed to carriage
25 in. x 16 ft. B. G. Boring Lathe, 2 heads and tail stocks,
on one bed, p. f. to tail spindle.
18 in. x 14 ft. Harrington Pattern Lathe, with carriage
rest.
These machines are O. K. Address

S. T. LUND, 77 Oliver St., Boston, Mass.

Machine Plants bought, sold, and appraised.

FRESH BARGAINS.

1 Sellers Steam Riveter with power
hoist, 42 in. gap, cyl. 36 in. x 3
in. stroke.

1 Sellers Steam Hammer, cyl. 18 in.
x 24 in., single standard.

1 52 in. x 52 in. x 20 ft. Betts Planer
—one head—fine order.

1 Sellers Axle Lathe.

1 Bement Bar Shear.

1 48 in. x 20 ft. Triple Geared Lathe.

1 Double Car-Box Blower.

1 48 in. Swing Drill Press.

1 15 Tons Yale & Towne Steel Jib
Crane.

1 5 Tons Pillar Crane.

2 5 Tons Wooden Foundry Cranes

2 3500 lb. Laddies on wheels.

Large Lot Pulleys, Shafting and
Hangers.

1 No. 9 Sturtevant Blower.

THOS. P. CONARD,

119 So. Fourth St.,

Philadelphia.

Machine Tools

IN STOCK FOR IMMEDIATE
SHIPMENT.

24 in. x 10, 12, 14 and 16 ft. Lathes.

30 in. x 26 ft. Lathe.

36 in. x 16 ft. "

42 in. Bullard Vertical Mill, 2 hds.

36 x 36 x 10 ft. Cincinnati Planer,
2 heads.

36 x 36 x 14 ft. Cincinnati Planer,
2 heads.

42 x 42 x 19 ft. Pond Planer, 3
heads.

6 ft. Acme Bickford Radial Drill.

800 lb Morgan Steam Hammer.

Full line Cincinnati Plain and Uni-
versal Milling Machines.

Marshall & Husehart Machinery Co.,

62 and 64 So. Canal St., Chicago, Ill.

19 So. Water St., Cleveland, Ohio.

510 Johnston Bldg., Cincinnati, Ohio.

**New and Second-Hand
Machinery**

FOR IMMEDIATE DELIVERY.

Engine Lathes, 10 in. to 32 in. swing.

Speed Lathes, 10 in. to 50 in. swing.

Shapers, 10 in. to 26 in. stroke.

Planers 20 in. to 34 in.

Drill Presses 10 in. to 28 in.

Milling Machines, Hand and Power.

Screw Machines and Monitor Lathes up to 20 in.

Feed and Power Presses, a variety of sizes.

Drop Hammers with and without automatic lifts.

Hurlburt & Rogers Cutting-off Machines.

Send for our latest list, also catalogue of our
new line of Presses, which we are just placing
upon the market.

The Danielson Machine & Tool Co.,

CLEVELAND, O.

Presses and Mills

One Arch Power Press with Dial Feed. Good
Order.

One three spindle Lathe, 12 in. x 6 in. swing, 8 ft.
bed, no countershaft. Good Order.

One Automatic Milling, Drilling and Tapping
Machine for finishing battery zincs. Can be
adapted for other work of a similar character. In
A1 Order.

One No. 2 Plain Drop Press, fitted with 200 lb.
hammer and power lifter, countershaft.

One Stand of Rolls, original size 10 in. diameter
x 15 in. face, now slightly under size: in good
order, including housings, pinions and main driv-
ing gear, designed to be driven from pinion on
main line underneath the stand

MOSSBERG & GRANVILLE MFG. CO.,
PROVIDENCE, R. I.

"As Good As New."

Engines.

22 in. & 40 in. x 48 in. Tandem Compound Harris
Corliss

16 in. & 35 in. x 48 in. Tandem Compound Greene,
for direct connection.

26 in. x 60 in. Harris Corliss.

22 in. x 42 in. Wright Corliss.

18 1/2 in. x 18 in. Armstrong & Sims Engine.

150 H. P. Compound Westinghouse.

Boilers.

2 250 H. P. Sterling Water Tubes for 150 lbs

2 150 H. P. Sterling Water Tubes for 150 lbs.

2 200 H. P. National for 125 lbs.

10 72 in. x 16 ft. Return Tubulars for 120 lbs.

1 60 in. x 16 ft. Return Tubular for 120 lbs.

4 90 ft. x 42 in. Stacks

1 600 H. P. Nordberg Jet Condenser.

Rossiter, McGovern & Co.,

141 Broadway, N. Y. Factory, Brooklyn, N. Y.

FOR SALE.

2 Vertical Compound Corliss Engines, 20-36 x 36
wheels, 17 ft. x 50 in. face.

200 ft. 7-in. steel Shafting, with floor stands and
couplings.

6 72-in. x 18 ft. Hor. Tub. Boilers, 120 pounds steam

3-ply leather Belting, 36 in., 42 in. and 48 in.

21-42 x 48 Cross Compound Wright Engine.

24 x 42 Watts Campbell Corliss.

32 x 60 " " "

14 x 32 " " "

Surface and Jet Condensers, Elevators, Dynamos,
Pumps, Hoisting Engines.

MARVIN BRIGGS,

12 Broadway, N. Y.

Notice.

Trustees' sale of Standard Sash and Door Co.;
has been purchased by me. Large factory, fully
equipped. Great bargain. Send for full list,
also large line of engines, boilers and pumps.

J. H. KERRICK,
Minneapolis, Minn.

IMMEDIATE DELIVERY.

12 Plain Vertical Engines, 3 to 50 H. P.

Plain Horizontal Engines, 10 to 150 H. P.

Automatic Engines, 15 to 300 H. P.

Direct Connected Engines, 15 to 300 H. P.

High grade and maximum efficiency.

Hoisting Engines from 5 to 50 H. P., single and double
cylinders and drums.

10 20 in. Lever and Wheel Feed Drill Presses.

10 20 H. P. Boiler Feed Pumps.

PENNSYLVANIA MACHINERY CO.,

The Bourse, Philadelphia.

MACHINE TOOLS

IN GOOD CONDITION.

1 12 in. x 20 in. Rice Automatic Cut-off Engine.

1 25 in. x 36 in. Slide Valve Engine.

1 24 in. x 12 ft. New Haven Lathe.

1 12 in. x 6 ft. New Haven Lathe.

1 18 in. x 6 ft. Lodge-Davis Lathe.

1 18 in. x 10 ft. Lodge-Davis Lathe.

1 45 in. Cincinnati Radial Drill.

1 24 in. x 24 in. x 6 ft. Wheeler Planer.

4 Small Screw Machines.

Also a complete stock of new machinery.

MONONGAHELA MACHINE TOOL CO.,

100 German National Bank Bldg., Pittsburg, Pa.

Machinery Bought, Sold and Erected.

Engines and boilers, all styles and sizes, both new
and second-hand; machinery of every description,
for all purposes. Write to me for anything you want.

WM. GRUENDLER,

225 N. Main St. St. Louis, Mo.

BLAST FURNACES FOR SALE.

We have for sale two Coke Furnaces, now in blast, each making over 175 tons per day. Also one Charcoal Furnace making 40 tons of Warm Blast Iron per day.

The output for the year of all these furnaces could be sold now at prices that will cover the asking price of each plant.

For particulars address

J. H. HILLMAN & SON,
Empire Bldg, Pittsburg, Pa.
Tel. 1238 Pgh.

2d-HAND FEED WATER HEATERS.

Largest stock in America. Will be sold at bargains. These heaters are mostly taken in exchange for our improved Berryman (Kelley's Patent), "A Little Giant," vastly superior to all other feed water heaters, both as to results and durability.

BENJ. F. KELLEY & SON, 91 Liberty St., N. Y.

BLOOMING MILL FOR SALE.

One 32 in. Reversing Blooming Mill with pair of 28 x 48 in. engines; also live tables, table engines, hydraulic manipulator, etc., built by Mackintosh, Hemphill & Co

W. J. CARLIN COMPANY,

610-611 Lewis Bldg.,

NEW YORK OFFICE: Pittsburg, Pa.
514-515 Park Row Bldg., New York, N. Y.

2d-Hand Machinery Bargains.

Corliss, High Speed Automatic, Simple, Compound, Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.

CHAS. BEHLEN,

72 Trinity Place, N. Y.

MACHINE TOOLS.

16 in. x 6 ft. Lathe.
18 in. x 6 ft. Lathe
48 in. Post Drill.
Single Punch capacity $\frac{1}{4}$ in. hole in $\frac{1}{4}$ in. iron.
400 lb. Steam Hammer.
50 lb. Justice Hammer.
50 lb. and 200 lb. Drop Hammers.
Giant Key Seaters.
Complete stock of new Machine Tools.

W. R. COLCORD MACHINERY CO.,
423-425 North 2d St., St. Louis, Mo.

FOR SALE OR RENT.

Large Foundry Plant fully equipped. Has exceptional shipping facilities over two belt and one trunk line railroads. Located just outside Chicago. For particulars address

"FOUNDRY PLANT,"

Care The Iron Age, 805 Fisher Bldg., Chicago.

LIGHT PLANT FOR SALE.

Two 35 H. P. Fischer C. C. high speed, self-oiling engines with two 400 incandescent Triumph dynamos with switch board, lamps and wiring.

W. J. CARLIN COMPANY,
610-611 Lewis Bldg., Pittsburg, Pa.

NEW YORK OFFICE:

514-515 Park Row Bldg., New York, N. Y.

Second-Hand.

One each 60 and 80 lb. Bradley Helve Hammer.
One No. 3 David Bell Steam Hammer.
Two No. 6 Root Blowers.
One No. 72 Ferracute D'ble Crank Press.
One 2 in. Cleveland Auto. Screw Machine.
One Pedrick and Ayer Horizontal Boring Machine.
Send for our No. 5 list, just out, of new and second-hand machinery.

DAWSON & GOODWIN,

41 S. Canal St., Chicago.

Immediate Delivery.

ENGINES.

2 18 $\frac{1}{2}$ x 15 McIntosh & Seymour Automatic.
1 New 18 x 16 Ames Automatic.
1 12 x 20 x 14 Ideal Tandem Compound.
1 12 x 12 Ideal 80 to 120 H. P. Automatic.
1 10 x 12 Ball 50 to 70 H. P. Automatic.
1 14 $\frac{1}{2}$ x 15 Armstrong & Simms Automatic.

BOILERS.

2 66 x 18.
3 72 x 16 and others, write.

PUMPS.

1 H. R. Worthington Duplex 14 x 19 x 15.
1 " " " Pressure 12 x 7 x 10.
1 Morris Machine Wks. Centrifugal and discharge.

HEATERS, 50 to 500 H. P.

BLOWERS, 30 and 36 inch.

DYNAMOS.

1 150 Kw. G. E. M. P., 550 R. P. M., 125 Volts.
2 150 Kw. Edison Bipolars, 500 Volts.
2 100 " " " 140 " "
1 50 Kw. 125 Volts Siemens & Halske.
2 60 Kw. Edison Bipolars, 125 Volts.
1 30 " " " " "
1 25 Kw. Westinghouse M. P., 125 Volts.
1 60 Kw. " two phase, 1000 Volts.
1 57 $\frac{1}{2}$ Kw. " single phase, 1000 Volts.
3 120 Kw. " " 1100 " "
Arc Dynamos, 12 to 150 light capacity.
Motors, direct and alternating current.
Gas Engines, 4 to 25 H. P.

Stock constantly changing; if you do not see what you want write. Ask for Price List No. 40.

ILLINOIS MAINTENANCE COMPANY, Inc.,
204 Dearborn St., Chicago, Illinois.

Large Engine and Machine Works

costing over \$500,000 and containing a complete outfit of

HEAVY MACHINE TOOLS,
FOUNDRY,
BOILER SHOP,
PATTERN SHOP.

Plant is complete, in good order and all ready to run and will be sold at a slight fraction of its cost to close up an estate. Address

READE & BOWLER,
CLEVELAND, O.

IMMEDIATE DELIVERY.

One Open Side Planer.

(48 in. Pattern),

Made to plane 60 in. x 60 in. x 12 ft. Two heads on beam and one side head.

Detrick & Harvey Machine Co.,
BALTIMORE, MD.

Boring Mills For Sale.

1 16 ft. Betts Boring Mill.
1 17 ft. Bement Boring mill.

W. J. CARLIN COMPANY,

610-611 Lewis Bldg., Pittsburg, Pa.

NEW YORK OFFICE:

514-515 Park Row Bldg., New York, N. Y.

FOR SALE OR TO LET.

Drop Forge Works, building 40 x 150 ft., all fitted up with modern tools. 3 Drops. 3 Power Presses. Machine Shop. Japanning Plant. Shears. Brick Boiler House. 2 Steel 40 horse-power Boilers. 1 50 horse-power Engine. Complete Oil-Fuel Plant. Side track in yard, no shifting charges. For information address

F. A. FISHER, Gloucester, Mass.

FOR SALE.

5,000 tons rich rolling mill cinder.
5,000 " pulverized iron ore for "fix" purposes or blast furnace use.

SCHULTZ & CO.,
Rothschild Bldg.,
14 So. Broad St., Philadelphia

Machinery Bargains.

One 8 x 16 Rice Auto. Engine.
11 x 22 Buckeye Engine.
11 x 11 Vertical Engine.
14 x 14 Marine Engine.
18 x 24 Atlas Automatic Engine.
One 24 x 24 ft. Shafting Lathe.
One 54 x 15 Erie Single Course Boiler, full front.
8 $\frac{1}{2}$ x 12 Lidgerwood Hoist.
One 6 x 4 x 6 Duplex Pump.
One 70 H. P. Otis Steel Fire Box Boilers.
One 200 H. P. Berryman Heater.
One 600 H. P. Rowe Feed Water Heater.
28 ft. 5.3-16 Shafting with 5 pillow block bearings.
Two Friction Clutch Pulleys, 72 x 16 in. face
90 H. P. Waste Heat, Vertical Boiler.
The above are all in first-class condition and ready for shipment.

A. L. DAWSON & CO.,

27-31 W. Washington St., Chicago, Ill.

FOR SALE.

Mill and Contractors' Machinery.

1 25 ton Morgan Square Shaft 10 ft. span traveling crane
2 Hydraulic Cranes.
1 Roll Lathe.
1 Hydraulic Press.

Machine Tools For Sale.

1 Suspended Drill Press with countershaft.
1 12 in. Fitchburg Shaper, sliding head.
1 9 in. Gould Shaper.

Engines and Pumps For Sale.

1 80 x 96 in. Vertical Corliss Rolling Mill Engine with 20 ft. fly-wheel.
7 Second-hand Steam Pumps
1 Centrifugal Pump.
3 Second-hand Hoisting Engines.
A full line of New Engines, Hoisting Engines, Shears, Grinding Pans, Stone crushers and Contractors' Machinery.

THOMAS CARLIN'S SONS CO.,

386 River Avenue,

Allegheny, Pa.

FOUNDRY EQUIPMENTS,

Second-hand, bought for cash; best price given for Cupolas, Blowers, Core Ovens, Cranes, Ladles, Tumbling Barrels, etc., etc. Give complete description.

THE J. D. SMITH FOUNDRY SUPPLY
COMPANY,
CINCINNATI, O.

FOR SALE.

One 25 in. x 8 ft. Richard's Open Side Planer, made by Pedrick & Ayer Co. In use since 1893. Address "OPEN SIDE," care The Iron Age, New York

FOR SALE.

One Hewes & Phillips Planer, planes 60 x 60 x 16 ft. Has one head on rail and side head, weight about 35,000 lbs. Is in good order and can be seen near here. Immediate delivery. For particulars, price, etc. apply or address

GEO. E. AFFLECK,
109 Liberty St., New York.

FOR SALE.

A Double Annealing and Case Hardening Furnace of Brown & Sharpe's latest pattern. In just as good order as when new. Prices and terms very reasonable. Address

ECLIPSE BICYCLE CO.,

[Elmira, N. Y.]

FOR SALE.

A Styles No. 3 Press with bolster plate, set of dies and punches to go with it. Has been used but a short time. Can be seen at

108-105 MOTT ST., NEW YORK.

For Quick Delivery.

Single Punch, 48 in. throat, 1 1/4 in. in 7/8 in.
 " " 42 in. " 1 3/8 in. in 1 1/4 in., motor driven.
 Single Punch or Shear, 25 in. throat, 1 in. in 1 in.
 Bevel Shear, 11 in. throat, for 3/4 in. plate.
 Splitting Shears, for 3/4 in. plate.
 " " for 5/8 in. plate.
 " " for 1/2 in. plate.
 Guillotine Frame Bar Shear, 17 in. knife.
 Double Angle Shear, 6 x 6 x 1 in., on turntable.
 " " 4 x 4 x 5/8 in.
 Multiple Punch or Gate Shear, 78 in.
 Punching and Riveting Press, 5 ft. gap.
 Plate Planer, 6 feet cut.
 Plate Bending Rolls, 1 1/4 in. x 100 in. plate.
 " " 12 ft. 2 in. between housings.
 Hand Spacing Table, 8 ft.
 Radial Drills, 48 in. and 60 in. arm.
 Flanging Clamps, for 10 ft. plates.
 6 1/4 ft. Gap Steam Riveter (in good condition).
 One pair 9 x 9 Duplex Engines, vertical.

HILLE & JONES COMPANY,
 Wilmington, Delaware.

Machinery and Engine Bargains.

1 17 in. x 8 ft. Johnson Lathe.
 1 18 in. x 16 ft. New Haven Lathe.
 1 28 in. x 20 ft. Blaisdell Lathe.
 1 40 in. x 21 ft. N. Y. S. E. Co. Triple Geared Lathe.
 1 24 in. x 24 in. x 6 ft. Fitchburg Planer.
 1 24 in. x 24 in. x 7 ft. Pond Planer.
 1 36 in. x 36 in. x 6 ft. New Haven Planer.
 1 21 in. Davis & Egan Geared Shaper.
 1 48 in. Niles Radial Drill.
 1 27 in. Throat Punch for 1 in. hole in 1 in. iron.
 1 Pair 24 x 48 Wm. Wright Engines on one shaft.
 1 18 x 22 Single Cylinder Double Drum Haulage Engine.
 Hoisting Engines for all purposes.
 Complete line new metal working machinery.
 For sale by

WM. C. JOHNSON & SONS MACH'Y CO.,
 St. Louis, Mo.

SPECIAL BARGAINS.

Second Hand Machine Tools.

One 15 in. x 6 ft. Blaisdell Lathe, Plain Rest, Taper Attachment.
 One 16 in. x 6 ft. Porter Lathe, Compound Rest, 1 1/2 in. hole.
 One 18 in. x 10 ft. Lodge Shipley Lathe, Compound Rest, Taper Attachment.
 One 26 in. x 12 ft. Perkins Lathe, Compound Rest, Raising Blocks to swing 34 in.
 One 6 in. Pratt & Whitney Shaper.
 One 6 in. Boynton & Plummer Shaper.
 One 20 in. Lodge Davis Crank Motion Shaper.
 One 22 in. x 22 in. x 4 ft. L. W. Pond Planer.
 One 5 ft. Hand Power Bending Rolls.
 One 6 ft. Power Bending Rolls.
 One 20 in. x 6 ft. Chucking Lathe.
 Four No. 2 Screw Machines, 1 in. capacity through wire feed.
 One 30 in. Bancroft Pulley Lathe, two Tool Rests.
 One Brainerd No. 4 1/2 Plain Milling Machine, Overhanging Arm.

THE FAIRBANKS COMPANY,

701, 703, 705 Arch St., - Philadelphia, Pa.

FOR SALE.

One 120 H.P. Cross-compound Armstrong & Sims Auto. Engine. Cylinders 1 1/4 in. and 1 3/4 in. by 15 in. stroke.
 One 12 x 36 Babcock and Wilcox Engine.
 One 8 in. x 14 in. Bullock Straight Line Auto. Engine.
 One 7 1/2 in. x 5 in. x 6 in. Duplex Worthington Pump.
 One 10 in. x 14 in. Pratt & Whitney Engine Lathe.
 One 20 in. x 10 ft. Field Engine Lathe.

THE E. H. WACHS CO.,
 158 Indiana St., Chicago.

FOR SALE.

HOISTING ENGINES.

14 New and Second hand Lambert, Mundy, Lidgerwood, Bacon, Orr & Sem-bower and Carlin Hoisting Engines.
 16 Horizontal and Vertical Boilers.
 10 Steam Pumps.
 12 Centrifugal Pumps.
 1 12 ton Harrisburg Steam Road Roller.
 1 14 x 43 in. Cooper Corliss left hand Engine, 12 ft. band wheel, 5 ft. pulley, both 20 in. face.

Carlin Machinery & Supply Co.,

101-109, Old No. 186, Lacock St.,
 Allegheny, Pa.

FOR SALE.

One 80 H. P. Boiler, 80 in. x 16 ft., 48 tubes 4 in., condition excellent. Price, \$300 f.o.b.
 Eight Drop Hangers, 12 in.—15-16 Ring Oiling, used two months, \$2 each.

DELAWARE HARD FIBRE CO., Wilmington, Del.

BARGAINS

IN SECOND-HAND

Electrical Machines.

SPECIAL LIST NO. 1.

Arc Dynamos.

2 American Wood, 20 light, 2,000 c. p.
 1 Western Electric, 30 " 2,000 c. p.
 1 T. H. L. D. 2— 35 " 2,000 c. p.
 1 Ft. Wayne Wood No. 6, 35 light, 1,200 c. p.
 1 Ft. Wayne Wood No. 8, 75 light, 1,200 c. p.

Alternators.

2 3 A. Slattery, 1,300 light, with exciters.
 2 A35 T. H., 650 light, composite wound, with exciters.

Direct Current, 110 Volts.

2 Edison 60 K. W., 1,100 light.

Send for Complete List of

Dynamos, Generators, Motors, Instruments, Switches, Lamps, etc.

STEWART ELECTRICAL CO.,

S. E. Cor. Fifth and Sycamore,
 CINCINNATI, O.

Bargain-Shafting Hangers.

No. 1, Makers, Dodge Mfg. Co., adjustable ball and socket double brace hangers, with chain oiling bearings.
 88-30 in. drop 2 15-16 in. shaft, List, \$25.50.
 18-30 in. drop 2 15-16 in. shaft, List, \$21.30.
 10-18 in. drop 2 15-16 in. shaft, List, \$20.15.
 Discount 70, 10 and 5 per cent.

MACHINISTS' SUPPLY CO.,
 Rochester, N. Y.

FOR SALE.

1 No. 2 Cincinnati Milling Machine, new.
 1 No. 2 Garvin Screw Machine, wire feed, second-hand.
 2 No. 2 1/2 Garvin Screw Machines, plain, second-hand.
 1 Double Head Garvin Screw Machine.
 1 12 in. Stroke Michels Shaper.
 1 30 x 30 x 9 Gleason Planer.
 1 12 in. Lathe with turret fitted.
 1 13 in. Swing Woodward & Rogers Drill Press.
 1 Same style as above but not W. & R. make.
 1 36 in. Heavy Bk. Gd. Drill Press, Massanet Mch. Co.
 1 Graves Hydraulic Elevator complete.
 1 24 x 24 x 6 Grey Planer, No. 26.

MACHINISTS' SUPPLY CO., Rochester, N. Y.

FOR SALE.

The following tools lately in use in a Boiler Manufacturing Plant.

1 40 ton 36 in. Gap Hydraulic Riveter.
 1 set 20 ft. Niles Rolls.
 1 100 ton Olsen Testing Machine.
 1 13 in. x 22 in. x 13 in. Westinghouse Engine.
 1 25 H.-P. Standard Westinghouse Engine.
 1 18 in. x 5 1/2 in. x 18 in. Barr Pump for 500 lbs. pressure.

For additional information address

ESTATE OF WM. G. WARDEN,
 1012 Witherspoon Building,
 Philadelphia, Pa.

FOR SALE.

Drawings, patterns, small tools, jigs and stock in process for the manufacture of an excellent line of machinery. Well established and with a good market. Orders on hand to amount of over \$15,000 which will be turned over. Address

"MACHINERY,"

Care Secretary Board of Trade,
 Worcester, Mass.

WANTED.

900 H. P. Vertical Engine; 8 and 12 x 12 tandem or cross compound engine; 75 to 200 H. P. Corliss engine; steam shovels; half yd. steam digger; 3 ft. saddle tank locomotives and contractors' equipment.
FOR SALE.—Pair 14 x 36 Harris-Corliss; 24 x 56 Watts-Campbell; 13 x 12 and 2 1/2 x 12 New York Safety. 100 K. W. M. P., 3,800, 500, 900, 150, 50 light dynamos. 2 20 H. P. crane motors, speed 500. 15 H. P., 220 volt motor, slow speed. 4 Sturtevant exhausters, 3 Buffalo blowers. Steam shovels, hoisting engines, crushers, coal mining machinery and contractors' equipment. **SEND DESCRIPTION** any machinery wanted or for sale.
 CHELSEA MACHINERY CO., Havemeyer Bldg., N. Y.

FOR SALE.

One Pond Planer, 36 x 36 x 17 ft.
 One New Haven Lathe, 25 in. swing, 18 ft. bed.

One Vertical Engine 14 x 14, roughtry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12 Engine.

Also a large lot of iron tanks.

WM. ECKBOLDS' SONS,
 711 E. Girard Ave., Philadelphia.

FOR SALE.

One Corliss Engine, 26 in. x 60 in., fly wheel 26 ft. diameter, section of rim 15 1/4 in. x 11 in. One Multiple Drill Press, four spindles, 8 ft. between housings, built by Messrs. Bement, Miles & Co., for drilling holes in plates.

Five trains of plate rolls. One 9 ft Flywheel, new, 7 in. bore, weight 6000 lbs. Two Bliss Guillotine Upright Shears, 72 in. gap, 8 in. stroke. One Dean Duplex Pump, 6 x 5 1/4 x 6. One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening rods up to 3 in. diameter and 25 ft. long. A lot of extra cold and hot plate rolls (new) and numerous other items from the Olney Copper Plant.

HENRY A. HITZER'S SONS,
 Gaul and Sergeant Sts., Philadelphia.

SECOND HAND IRON PULLEYS.

We have on hand a large quantity of all size Iron Pulleys in good condition. In this lot are some extra large sizes. Our price on them is very low. Ask for our list.

Also on hand

BRAND NEW WOOD SPLIT PULLEYS,

that we bought at receiver's sale. Be sure to get our prices. We can save you money on

BELTING, SHAFTING, HANGERS

and supplies of all kinds. We are headquarters for

SECOND HAND MACHINERY.

Write at once for Catalogue No. 78.
 Address

Chicago House Wrecking Co.,

WEST 35th and IRON STREETS,
 CHICAGO.

NEW TOOLS FOR QUICK DELIVERY.

8 ft., 10 ft., 12 ft. and 14 ft. Bertsch's Patent Power Bending Rolls for 3/4 in. plates; Universal Plate Shears for 1/2 in., 3/4 in., and 1 in. plates. Boiler Makers' Power Punches for 1/2 in., 3/4 in. and 1 in. plates.

SECOND-HAND TOOLS

In Good Condition.

37 in. Forming Roll; (2) 31 in. Power Squaring Shears; Interchangeable Power Punch and Shear; 4 in. Throat Lever Punch; (2) Sheet Iron Shears.
 Address BERTSCH & CO.,
 Cambridge City, Ind.

CORLISS ENGINES FOR SALE.

Two 31 x 40 Horizontal Engines, one right hand and one left hand. These engines are now coupled to one shaft but would furnish with fly wheel or band wheel to suit each separately.

W. J. CARLIN COMPANY,

610 and 611 Lewis Bldg., Pittsburg, Pa.

New York Office:

514-515 Park Row Bldg., New York, N. Y.

FOR SALE. SPECIAL ENGINES.

- 1 14 in. x 20 in. (Vertical) Slide Valve.
- 1 14 in. x 30 in. Keystone Corliss (Brand new).
- 1 16 in. x 30 in. "Rice" Automatic Heavy Duty Type, 150 revs. per M.
- 1 11 in. and 19 in. x 24 in. Tandem Comp'd "Buckeye" (latest type) with condenser.
- 1 20 in. x 48 in. Woodruff & Beach Automatic.
- 1 22 in. x 42 in. Wetherill Corliss
- 1 22 in. x 42 in. do
- 1 23 in. x 48 in. Geo. H. Corliss make.
- 1 24 in. x 36 in. Mackintosh, Hemphill & Co., Bal. Slide Valve.
- 1 28 in. x 60 in. Piston Valve Type.

BOILERS.

- 3 Horizontal Tubular, 72 in. x 16 ft., with 84 3/4 in. tubes, approved for 100 lb. pressure, complete.

SHAFTS and PILLOW BLOCKS.

- 15 Very fine Forged Shafts, finished all over, 10 in. diam. to 16 in.

FLY WHEELS.

For use as balance wheels and as belt wheels.

SMOKE STACK.

Very fine steel self-supporting stack 64 in. diam., 100 ft. high, with base casting, ornamental top and ladder.

HAMMERS.

- 1 Hackney Cushion Hammer.
- 1 1200 lb. Double Frame Steam Hammer.
- 1 4 ton do

BELTING.

- 1 Fine double leather belt serviceably equal to new. 35 in. wide and about 130 ft. long.

SHEARS.

- 1 Massive Alligator Shear for cutting old rails, billets and scrap iron, with engine built on. Built by Lewis Foundry, Pittsburg.

*Signifies Right-hand.
†Signifies Left-hand.

B. M. EVERSON,
German Nat. Bank Bldg. (6th and Wood),
PITTSBURG, PA.
Sales Agent for
Baldwin Locomotive Works, Phila.

For Sale.

One 25-ton 50 ft. span, MORGAN Square Shaft Crane, in good condition and ready for immediate delivery.

THOMAS CARLINS' SONS CO.,
386 River Avenue, Allegheny, Pa.

SPECIAL SALE OF Bolt and Nut Machinery.

All in good condition and most practically new.

- 1 Olsen 2 in. Bolt Header.
- 1 National 1 1/2 in. Double Bolt Cutter.
- 1 Acme 1 1/2 in. Double Bolt Cutter.
- 1 National 1 in. Single Rapid Bolt Cutter.
- 1 Olsen 4 spindle 1 1/2 in. Geared Nut Tapper.
- 2 Sensitive Tapping and Threading Machines for 3/4 in. and smaller.
- 1 Sensitive Tapping and Threading Machines for 3/4 in. and smaller.
- 1 Chapin 300 lb. Drop Hammer.

Above tools and others at a bargain.

VONNEGUT HARDWARE CO.,
Metal and Woodworking Machinery,
Indianapolis, Ind.

We buy old RUBBER.

Write, if you have anything to offer.

WALSH'S SONS & CO., Newark, N. J.
Iron Machinery, &c.

WANTED.

One mile of second hand, 30 lb. steel rails, with splices complete, for delivery by June 1st.

Five miles of second hand 4 in. wrought iron pipe, for delivery by June 1st. Address,

A. B. SMITH CHEMICAL CO.,
Bradford, Pa.

For Sale.

The entire plant of the UNITED STATES PIN CO., located at Seymour, Conn., on line of N. Y., N. H. & H. R.R. (Naugatuck Division), consisting of buildings, real estate and valuable water power on the Naugatuck River, including all machinery used by the above mentioned Company for the manufacture of pins.

For full particulars and price address

United States Pin Co.,

Or Olin L. Dibble,

Seymour, Conn.

Scrap Wanted.

Heavy and Light Steel Melting Scrap, also Heavy Cast Machinery Scrap, such as housings, bearings, rolls, etc. send full description of material with lowest cash price.

F. GREINER,
406 Drexel Building, Philadelphia, Pa.

ORES FOR SALE.

Following ores are offered for sale for delivery during the year.

	Manganese.	Iron.	Silica.	Phosphorus.
No. 3 A.	31.95	20.40	9.98	.15
No. 3 A.	13.16	36.09	15.	.10
No. 3		55.1	4.74	1.45
No. 4		42.80	34.	.55

Tonnage, shipping points, prices and particulars on application to

GEO. B. HOOKER,
618 Pa. Ave. N. W., Washington, D. C.

FOR SALE.

One Duplex Steam Driven Air Compressor, capacity 300 feet free air per minute; steam cylinders 10 in.; air cylinders 12 in.; stroke 14 in.; Wilson-Snyder Mfg. Co. makers.

The Westinghouse Machine Company,
Pittsburgh, Pa.

WANTED.

First-class modern machine shop wishes to manufacture some specialty (machine tools preferred). Will buy patent or pay royalty. Address, "R. A."

care The Iron Age, 805 Fisher Building, Chicago.

FOR SALE. AT A BARGAIN.

1 Second-hand Corliss Eng., 14 in. x 42 in.
1 Stone Crushing Plant, complete.
1 75 H. P. Fitchburg Eng., second-hand.
Dealer in New and Second-hand Machinery.
W. M. FLINTOFF, Beverly St., Boston.

FOR SALE. CORLISS ENGINE

Cylinder, 30 in. x 60 in.; shaft, 11 in.; wheel, 18 ft. in diameter x 44 in. face. The engine is in first-class condition, and may be seen at the Works of this company in Chicago.

McCORMICK HARVESTING MACHINE CO.,
Chicago, Ills.

FOR SALE, SECOND-HAND TOOLS.

- One "Newton" Cold Saw.
- Three "Bryant" Cold Saws.
- One "Whitcomb" Planer, 37 in. x 36 in. x 9 ft.
- One Horizontal "Hilles & Jones" flange or angle punch, 7 in. throat; will punch 3/8 in. through 3/4 in.
- One "Cockburn" Concrete Mixer.
- One "Sturtevant" Blower, No. 8.
- One do. do. No. 5.
- Two Horizontal Tubular Boilers, 66 in. x 16 ft. with 90 three-inch tubes, now running under 80 lbs. pressure.

ALSO

NEW CORNELL BLOWERS—Poole's patent, all sizes—the best in the market—send for prices.

J. B. & J. M. CORNELL,

26th St. and 11th Ave., New York City.

- 1 20 in. x 48 in. Corliss Engine. 1 8 in. x 12 in. Ames.
- 1 8 in. x 12 in. Erie. 1 7 in. x 10 in. Porter. 1 6 in. x 10 in. Payne. 1 4 in. Morris Tasker Pipe Cutting and Threading and Treadle. 1 Blaisdell Back Gear Drill, 30 in. 1 125 Horse Horizontal Boiler. 3 20 Horse Upright Boilers. 1 Boiler Plate Planer, 16 ft., made in Scotland. 1 Hydraulic Riveting Machine, 36 in. gap. 1 48 in. Swing Lathe, short bed. 2 Double Belts, Hoyt's make, 104 ft.; one 86 ft. x 18 in.

ROBERT J. GRAY, 52-54 East 132d St., New York.

Where to Locate.

Manufacturers using iron, steel or wood will find the best locations for successful plants along the

SOUTHERN RAILWAY.

These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

M. V. RICHARDS,

Land and Industrial Agent, Southern Railway,
WASHINGTON, D. C.

PUMP BARGAINS.

Two inch Rotary Pump. Douglas 1 1/4 in. feed Power Pump. Douglas 1 1/4 in. feed Power or Hand Pump. 7 in. x 8 in. Gould Triplex Power Pump. 4 in. x 5 in. Baldwinville Power Pump. No. 5 Acme Valley Pump. No. 2 Acme Valley Pump. Hall Air Pump, 5 in. x 7 in. cylinder. Knowles Duplex Pump and Receiver, cylinder 4 1/2 in. x 2 1/2 in. x 4 in. Valley Duplex steam, cylinder, 5 1/2 in. x 3 in. x 3 in. Dean No. 2 Steam Cylinder. Knowles Steam Cylinder. Ames Steam Cylinder. Write for list. HANNAN & FINTON, Springfield, Mass.

FOR SALE.

7000 ft. Light Weight 11 in., 13 in. and 15 in. Pipe.
100,000 ft. Standard Pipe, all sizes.
36 Boilers from 6 H. P. to 125 H. P.

ENGINES, SLIDE VALVE.

- 1 16 x 20 Center Crank Erie.
- 1 16 x 24 Warren.
- 1 14 x 20 Woodbury & Booth.
- 1 Pair Twin 12 x 15 McCune.

ENGINES, AUTOMATIC.

- 1 20 x 48 Wheelock Corliss.
- 1 12 x 20 Atlas.
- 1 16 x 24 "
- 1 12 x 14 Rees.
- 4 11 x 14 Westinghouse.
- 2 20 H. P. Foos Gas Engines.

McDOWELL & CO.,
247 Fifth Ave., Pittsburg, Pa.

ENGINES and BOILERS.

- 3 60 in. x 18 ft. Tubular Boilers.
- 1 12 in. x 36 in. Lane & Bodley Corliss Engines.
- 1 12 in. x 18 in. Russell Automatic Engine.
- 1 14 in. x 20 in. Atlas Automatic Engine.
- 1 20 x 24 Rolling Mill Engine.

Send for list of over 150 refitted Boilers and Engines.

W. D. NORTON,
6th and Carr Sts., Cincinnati, O.

COLLECTIONS,

ATTACHMENTS, REPLEVIN, BANKRUPTCY,
By telegraph, telephone, or cable. CREDITORS' LEGAL UNION, offices, 302 B'way, N. Y.; 1 Montgomery St., Jersey City, N. J. Tel. 2571 Franklin. Cable, Credlegun, W. U. code.

SPECIAL PRIVATE SALE.

Machinery Victor
Bicycle Plant. Large
assortment Planers,
Lathes, Shapers,
Automatic and Hand
Screw Machines,
Drops, Hammers,
Drill Presses and
Special Cycle Ma-
chinery. All in A 1
condition. Over 400
machines. Power and
Space to Rent.

J. STEVENS ARMS AND TOOL CO.,

P. O. Box 46,

CHICOPEE FALLS, MASS.

FOR SALE

Stock of Hardware and Farm Implements in town of 600 population; doing a good business. The only Hardware in town: good farming country. A good chance for any one wishing to go in the business; reason for selling, I wish to retire from business. For full particulars, address

URIAS MENSEH,
Culver, Marshall Co., Ind.

Machinery Bargains.

DOUBLE ENGINES.

18 x 42 Slide Valve, horizontal box, bed plate, shaft 8 1/2 in. diameter, double cranks, 3/4 in. pins, built by Starbuck, with or without belt wheel, \$1,200.00.

PLANERS.

48 x 48 x 16 ft. bed, made by Rollins, Nashua, N. H. Price, \$800.00.
34 x 34 x 15 ft. bed, made by Fairbanks, Providence, R. I. Price, \$500.00.

LATHES.

Two 16 in. swing, 6 ft. bed, made by Putnam. Price, \$125.00.
One 15 in. swing, 6 ft. bed, made by Wood & Light. Price, \$125.00.
Two 18 in. swing, 8 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, \$125.00.
One 17 in. swing, 8 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, \$125.00.
One double head lathe, 32 in. swing, 20 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, \$500.00.

F. O. B. cars, Philadelphia, Pa.

A. V. KAISER & CO.,

222 South Third St., Philadelphia.

For Sale, Cheap.

One 10 x 24 Corliss Engine. Also
one No. 10 Davidson Steam Pump.

M. P. COLEMAN,

77 Haverhill St., Boston, Mass.

PARTIAL LIST OF Second-hand Machinery IN STOCK.

280 H. P. 60 in. x 16 ft. Tubular Boilers.
2125 H. P. 66 x 18 Tubular Boilers.
160 H. P. Locomotive Boiler.
1110 H. P. Locomotive Boiler.
1150 Buckeye Automatic Engine, size 15x18.
1125 Buckeye Automatic Engine, size 14x16.
1150 Ball Automatic Engine, size 15x14.
1100 Ideal Automatic Engine, size 13x12.
1 No. 12 Morris Centrifugal Sand Pump, direct connected to 12 in. vertical engine.
2 No. 6 Morris Centrifugal Sand Pumps.
1 16x10x10 Worthington Duplex Pump.
1 12x12x10 Worthington Duplex Pump.
1 12x12x10 Worthington Duplex Pump.
1 7x4x10 Worthington Duplex Pump.
1 No. 7 Knowles Pattern Single Pump.
1 No. 5 Knowles Pattern Single Pump.
1 Deane Duplex Power Pump, 5 in. plungers.

RAINIER & WILLIAMS,

64 So. Canal Street, Chicago, Ill.

Factory Superintendent Wanted.

Must be a good mechanic and understand handling men. Should be familiar with sheet metal blanking and forming, drop forging and polishing. If desired, an arrangement could be made for investment on very advantageous terms of, say, \$15,000 to \$25,000 in an established and very profitable business, but it must be coupled with mechanical ability of the right kind. Address "NEW ENGLAND,"

care The Iron Age, New York.

VALUABLE IRON ORE MINE TO BE LEASED.

Solid vein of hematite, 60 ft. wide, 60 per cent. iron; over 100,000 tons have been removed. More left. Mine alongside of N. C. R. W., close to furnaces. Inquire of

DR. G. E. HOLTZAPPEL,
20 S. Geo. St., York, Pa.

FOR SALE CHEAP.

Brick Factory, 24,000 ft. floor surface, detached boiler house, good engine and boiler, three acres of land located in thriving city Indiana Natural Gas Belt. Address "FACTORY," care The Iron Age, 1205 Fisher Bldg., Chicago.

WANTED.

Small staple or patented articles to manufacture. Cash paid for acceptable ideas.

Address "X. O. B."
Care The Iron Age, New York.

To Manufacturers.

I have an article in the Cabinet Hardware Line which is simple, practical and superior in every way to the one now in use. Patented February, 1900. No very intricate or extensive line of machinery is required to manufacture it. Its superiority and simplicity appeal at once to every one who sees it. The patent and all rights and interests will be disposed of at a very reasonable figure. This is an excellent opportunity for the manufacturer who has additional capacity, as there is undoubtedly a large market for the goods.

WM. L. FLDER,
Indianapolis, Ind.

Wanted to Make

We have a complete modern manufacturing plant near Boston, equipped with Power Presses, Automatic Screw Machines, Nickel Plating and Polishing Plant and want to correspond with parties having articles that can be made in such a factory. Address

"W.,"

care The Iron Age, 70 Kilby Street, Boston, Mass.

FOR SALE.

Two Laidlaw Dunne Gordon Co. Gas Compressors, 30 x 30.

One Corliss Engine, Lane & Bodley, 24 x 30.

One Rockwell Pressure Oil Burner.

All in good condition and but little used.

Address BOX 801,
Findlay, Ohio.

Hardware Stock For Sale.

A \$7,000 well assorted stock of General Hardware and good will of business, in town of 12,000 inhabitants, located in the best agricultural country in Eastern Kansas. Established 30 years. Building rental reasonable. Quitting business on account of old age. Address

W. H. DUNCAN,
Lawrence, Kan.

WANTED

by experienced party to buy out or become partner in an established manufacturing business. Metal line preferred. Could invest about one hundred thousand dollars. Will communicate with principals only. Address

"METAL 53,"
care The Iron Age, New York.

For Sale, Machinery.

Planer 44 x 44, 16 ft. bed, 9 ft. extension Punch, L. & A. No. 1 heavy, 10 1/4 in. throat. Bolt Header, National Head to 1 1/4 in. Blower, 35 in. Buffalo. Scarfing Machine, Pulleys, Hangers and other miscellaneous machinery a bargain, as we need the room.
No. 716 EAST THIRD ST., CINCINNATI, O.

FOR SALE.

Profitable wholesale-retail general Hardware business, long established, in perfect running order. Stock \$18,000, could reduce to \$12,000 quickly. Capital opportunity cash buyer. Correspondence and inspection invited. Address

GRISWOLD, MALONEY & CO., Owners, Elmira, N. Y.

TELEPHONES 1410-1411 JOHN.
B. NICOLL & COMPANY,
68 WALL STREET, NEW YORK.
WIRE RODS,
BILLETS.
IRON ORE and MILL CINDER.
FOUNDRY, FORGE, BESSEMER and BASIC PIG IRON.
Steel and Iron Scrap for Open-Hearth Furnaces Bought and Sold.
Furnace Agents, Exporters and Importers.

FOR IMMEDIATE DELIVERY:

**Angles, Beams,
Channels, Plates,
Tees, Zees, Bars**

5000 tons in stock. Moderate prices. Send for stock sheet and quotations.

**STRUCTURAL DEPARTMENT,
ILLINOIS STEEL CO.,**

Designers, Manufacturers and Erectors of Structural Iron Work, Dealers in Structural Materials.

50 Wabansla Ave., CHICAGO.

**BEAMS, CHANNELS,
ANGLES, PLATES.**

Eye Beams, from 4 ins. (7½ lbs.), to 30 ins. (65 lbs.)
Channels, from 4 ins. (5½ lbs.), to 15 ins. (33 lbs.)
Angles, from 1½ ins. x 1½ ins. x 3-16 in. to 6 ins. x 6 ins. x ½ in.
Angles, from 3½ ins. x 2 ins. x 3-16 in. to 6 ins. x 4 ins. x ¼ in.
Zee Bars, 8 ins., 4 ins. and 5 ins.
Plates, 1½ lbs. and over

All material in 50-ft. lengths or cut to specified lengths if desired. Send for detail stock list.

All material in stock, and will be shipped immediately on receipt of order.

Quotations subject to prior sale.

**THE FOREST CITY STEEL & IRON CO.,
Cleveland, O.**

Wagon Tires,

**STEEL OR IRON,
RD. EDGE OR SQUARE.**

Angles Up To Four Inch.

**LOGAN IRON & STEEL CO.,
BURNHAM, PA.**

Buyers of Scrap for Cash.

FOUNDRY FOR SALE

At a great bargain. Established business. New building. Splendid location. Address

**J. A. HAMILTON & CO.,
Algonia, Ia.**

A RARE OPPORTUNITY.

An opportunity seldom offered. For sale, a clean stock of Hardware in a Railroad centre, in a growing Western city of 30,000 people. Fine agricultural country surrounding. The State Agricultural Board are making plans now for permanent State Fair buildings. Two new railroads now building. The owner, after 34 years of successful business, wishes to retire. Will be sold cheap. No trade. Will invoice \$10,000 to \$12,000. Address, "S. H. D." 45, care *The Iron Age*, N. Y.

FOR SALE.

Hardware Stock in city of 3000 in Eastern Iowa; good location; fine brick building; plate glass front; long lease. Will invoice about \$5000. Only one other stock in the city. Or will sell a half interest to a good plumber who comes well recommended. We believe this is the best opening in the hardware business to be found in the State of Iowa. Write for fuller particulars. Address, "COUNTY SEAT," care *The Iron Age*, New York.

WANTED.

Second-hand Saddle Tank Locomotive, in good condition, not less than 36 tons weight; low drivers, 48 to 50 inches; cylinder not less than 16 inches, 24-inch stroke; standard gauge. Address P. H. GRIFFIN MACHINE WORKS, Buffalo, N. Y., giving full particulars and lowest price.

FOR SALE.

5000 to 6000 tons 56 lb. Steel Relaying Rails with angle bars, suitable for Eastern, Southern and South-western delivery.

2500 tons 60 lb. Steel Relaying Rails with angle bars, delivery on line of Chicago & Alton Railroad.

1000 tons 70 lb. Steel Relaying Rails with angle bars, delivery at Chicago, East St. Louis and Kansas City.

100 tons 40 lb. Iron Relaying Rails with fastenings, f.o.b. cars, Cincinnati.

60 tons 16 lb. Iron Relaying Rails, f.o.b. cars, Cincinnati.

Two miles 35 lb. Steel Relaying Rails with angle bars, f.o.b. cars, Boston.

Several locomotives of various types.

ISAAC JOSEPH IRON CO.,

Swift Building, Cincinnati, Ohio.

WE PURCHASE FOR CASH

Scrap Iron and Scrap Steel and Metals of every description.

M. SAMUEL & SONS,

Kent Ave. and North 2d St., Brooklyn.

Washington and Bethune Sts., New York.

Relaying rails on hand cut to any lengths.

**FOR SALE.
RELAYING RAILS, ETC.**

350 tons 60 lb. Steel Relaying Rails with Angle Bars.
500 tons 50 lb. " " " " Fastenings.
150 tons 40 lb. " " " " Splices.

100 tons 35 lb. Box, Flat and Gondola Cars, new and second-hand.

MAY & SPALDING,

32 Broadway, New York and Atlanta, Ga.

**FOR SALE
Relaying Rails.**

1500 tons 56-lb. Steel, with angle-bars.
100 tons 45-lb. Steel, with Fisher joints.
2000 tons 40-lb. Steel, with splices.

Tidewater delivery.

THE STEEL RAIL SUPPLY CO.,

100 Broadway, New York City.

Scrap Iron and Old Metals.

EDW. O. MILES & CO.,

278 to 298 Marietta St., Atlanta, Ga.

**CORRESPONDENCE SOLICITED FROM
BUYERS AND SELLERS.**

Relaying Rails For Sale.

100 tons 20 lb. with splices.

50 " 30 " " "

Also 65, 56 and 25 lb. small lots.

DONALDSON & NEWTON,

421 Chestnut street, Philadelphia.

WANTED.

Scrap Iron and Steel

Correspondence Solicited.

C. Botjer, 405 Newark St., Hoboken, N. J.

FOR SALE FROM STOCK.

EYE BEAMS, from 8 ins. to 20 ins.

CHANNELS from 1½ ins. to 15 ins.

ANGLES, both even and uneven leg, from 1 in. to 6 ins.

FLATS, from 1 in. to 30 ins. in width. Will cut to specified length and sell either plain punched or riveted.

BUILDING and STRUCTURAL IRON of all descriptions.

BELMONT IRON WORKS,

23d and Washington Ave., Philadelphia, Pa.

E. BISSELL & CO.

WHOLESALE

HARDWARE AUCTIONEERS,

13 Murray St. and 13 Park Place, N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

Scrap Iron, Steel & Metals

New Jersey Iron & Metal Co.,

PATERSON, N. J.

Write us when you have Scrap to dispose of or want to buy.

**Scrap Iron, Steel and
Iron Rails**

bought and sold by

M. J. & M. BLAKE,

10th Ave. and 15th Street,

New York City

Telephone Call, 897 18th St.

JOHN LEONARD.

MICHAEL BLAKE.

**JOHN LEONARD & CO.,
IRON AND STEEL SCRAP.**

IRON AND STEEL RAILS, PIG IRON, ETC.

220 Broadway,

ST. PAUL BUILDING,

NEW YORK.

TELEPHONE, 975 CORTLAND.

Correspondence Solicited.

The Morton B. Smith Co.,

243 FRONT ST., NEW YORK.

OLD METALS

of every description purchased for cash, also

SCRAP IRON and STEEL

In car load lots

Correspondence solicited.

FOR SALE.

300 tons of original 65 lb. relaying steel rails, present weight about 62 lbs.

RICHARDSON & COMPANY, Inc.,

Pittsburgh, Pa.

W. H. Perry Co.,

Providence, R. I.

BUYERS OF

**SCRAP IRON
AND STEEL.
FOR SALE.**

21 Cylinder Boilers, 12 42 in. diameter, 30 ft. long and 12-36 in. diameter, 30 ft. long wrought iron heads, suitable for stack; also two Narrow Gauge Baldwin Locomotives.

L. & R. WISTER & CO.,

672 Bullitt Bldg., Phila., Pa.

F. R. Phillips & Sons Co.,

302-3 Harrison Building, Philadelphia.

**Steel Rails,
Melting Scrap, Etc.**

I buy Iron and Metal Scrap and wish to hear from anybody having cotton ties, pipe, hoops, cast borings, wrought and steel turnings, boilers, cast scrap, etc. Also wrecks from fire, etc.

ROBERT M. CUNLIFFE,

1140-42 Washington Ave., Phila., Pa.

BERKSHIRE IRON YARD,

M. H. ROGERS, Owner.

Scrap Iron, Metals, Etc.

221-223-225 Housatonic Ave.,

BRIDGEPORT, CONN.

TELEPHONE.

SHOPS For Rent

OVER 40,000

Sq. Feet of Floor Space.

Six Buildings, stone and brick construction, located at Hazelton, Pa., on the line of the Lehigh Valley R. R., suitable for foundry, machine shops, or plant of any nature. Formerly occupied by L. V. R. R. as machine and car shops.

Will rent at an extremely low figure.

For full particulars address

THOS. W. HULME,

Asst. Real Estate Agent,

L. V. R. R. Co.,

228 So. 3d St., Philadelphia, Pa.

FOR SALE.—SPECIAL.

One 60 x 16 Horizontal Tubular Boiler, complete with fittings

One 12 x 18 Tangye bed, slide valve engine, with 9 ft. x 12 in. face.

Berryman heater, 48 ft. of 30 inch stack and piping complete.

Will sell all the above at \$600.

PARADOX MACHINERY CO.,

177 East Division St., Chicago

WANTED TO BUY

The controlling interest in a manufacturing company, making hardware or light machinery. From \$75,000 to \$100,000 to invest. Address

"J. H. D.,"

Care *The Iron Age*, 1405 Fisher Bldg., Chicago.

FOR SALE.

Stock of Hardware, Tinware, Stoves and Fixtures, in thriving town of Eastern Pa. Stock with inventory \$5,000. Owner's failing health cause for selling. A good opening. Correspondence solicited. Address "S. B. K.," Box 116, Palmyra, Pa.

FOR SALE, BOILER WORKS.

On account of death will sell interest in or all of good paying boiler business. Established over 20 years. Address

SCIOTO BOILER WORKS, Columbus, Ohio.

WANTED TO BUY, A Machine for Grinding Slate.

JACOB RINGLE & SON,

Jersey City, N. J.

ALL HARDWARE, BRUSH AND TURNERY MANUFACTURERS

to send price lists of their goods suitable for wholesale and Retail General Furnishing Ironmongery. **GEO. H. HOPE,** 17 Phillips Chambers, St. Georges Street, Cape Town.

FOR SALE.

450 4 in. x 18 ft. Boiler Tubes.

150 3 1/2 in. x 16 ft. "

21 14 in. x 16 ft. 9 in Riveted Flues.

H. B. BIRTWELL, 126-130 East Sixth St., Chester, Pa.

Ice Skate For Sale.

Two patents, Dies, Special Machinery, Stock, Etc. Low price for cash. Send for our list of Patents.

P. O. FOX 2294, Rostor, Mass.

Situations Wanted

Undisplayed Advertisements for Situations Wanted not exceeding twenty-five words, including address. Fifty cents each insertion. Additional words two cents each.

Agencies for hardware specialties for Europe; will start for Europe this month; first-class references. Address "S. H., 53," care *The Iron Age*, New York.

SUPERINTENDENT, open hearth steel plant, basic or acid; all grades of steel; over 20 years' practical experience; can give best of references. Address "O. H. Steel," care *The Iron Age*, New York.

FOUNDRIY FOREMAN; experienced on light and heavy work, dry or green sand; up to date in modern foundry practice, desires position where skill and close attention to business would be appreciated; write for references. Address "Up to Date," care *The Iron Age*, New York.

Wholesale or retail **SALESMAN** or **CLERK;** builders' general hardware and house furnishing; six years' experience city trade; special stock keeper; age 29; wants hustling position; references. Address **M. Rockwell,** 98 Barclay street, New York.

GUIDE ROLLER desires to make change; well up in guide, shape, bar and scalp iron and steel; has had experience on common, Belgium and special trains, and is well posted in the art of turning out large productions; can give references. Apply "Guide and Shape," care *The Iron Age*, New York.

As **SALESMAN, ASSISTANT BUYER** and **MANAGER** in wholesale or retail hardware house, where there is opportunity for advancement; at present traveling, but wish to leave the road; references from present and former employers. Address "T. F. D.," care *The Iron Age*, New York.

MECHANICAL ENGINEER, technical education, 18 years' wide and successful experience, desires a change; now holding responsible position; highest references. Address **Lock Box 1,** Glen Ridge, N. J.

WIRE NAIL FOREMAN; have had 15 years' experience as operator and foreman; thoroughly familiar with all the latest improved machines; satisfactory references. Address "Wire Nail," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

A **ROLL TURNER** of good character and ability wants a situation. Any firm desiring to employ such a man, please address "X.," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

Foundryman now in office business considering position as **SUPERINTENDENT, MANAGER** or **CHEMIST;** age 39; 16 years' experience blast furnace, soft and chilled castings, cupola and air furnace mixtures, control of melting, chemist, clerk, inspector, assistant manager; ten latter years successfully practicing foundry metallurgy, using complete analysis of the stock and daily physical tests of cast metal; full records; stock selected and output regulated with accuracy and economy. Address "Tech.," care *The Iron Age*, 117-119 South Fourth street, Philadelphia, Pa.

Young man, age 25, nine years' experience in hardware and kindred lines as **TRAVELING SALESMAN** on salary or commission; can furnish best of references and security if necessary. Address "Ambitious," care *The Iron Age*, New York.

As **SALESMAN** and **DEPARTMENT MANAGER** in hardware house where advancement is assured to right person; am at present employed, but desire to make a change. Address "Energetic," care *The Iron Age*, New York.

As **ENGINEER** or **CHIEF DRAFTSMAN** by a young man who is desirous of making a change, and who has had 11 years of experience on blast and open hearth furnaces, steam, hydraulic, electrical and general machinery. Address "Engineer," care *The Iron Age*, New York.

As **ASSISTANT BOOKKEEPER** in a wholesale and retail hardware store; a man familiar with hardware office work. Address "Assistant," care *The Iron Age*, New York.

Responsible position wanted by **ROLLING MILL ENGINEER** of large practical experience; thoroughly posted on modern construction and management of rolls, all kinds of rolling mill machinery, open hearth and heating furnaces, &c. Address "G. N., No. 45," care *The Iron Age*, New York.

Young man, 14 years' experience in iron and steel business, desires connection with good commission house or mill in same line; best of references; can invest several thousand dollars in the business if necessary. Address "D. S. E.," care *The Iron Age*, New York.

Position by a thorough practical **FOUNDRIY FOREMAN** on all classes of heavy work; thoroughly understands mixing and melting iron in cupola and air furnace; can furnish first-class references. Address "Loam," care *The Iron Age*, New York.

FOREMAN MASON desires to take charge of building construction; reliable and experienced in erection of manufacturing plants, public buildings, &c.; age 35; good references. Address "Builder," care *The Iron Age*, New York.

Help Wanted.

Undisplayed Advertisements for Help Wanted not exceeding fifty words, including address, One Dollar each insertion. Additional words two cents each.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

Experienced **CHEMIST** and **METALLURGIST** wanted for large foundry and machine works in South Germany. Address with references and state experience, "Chemist," care *The Iron Age*, New York.

SALESMAN now calling on retail hardware trade of New York and Pennsylvania to represent a standard line on commission. Address "Retail Trade," care *The Iron Age*, New York.

MACHINERY SALESMAN.—A first-class technically educated man of experience and ability to travel in the Eastern and Middle States; must be a thoroughly competent and energetic man, capable of handling large operation. Address "Technical," care *The Iron Age*, New York.

Business man in machinery manufacturing sales office; must be an experienced and energetic man, capable of taking charge of a department, correspondence and sales. Address "Sales Office," care *The Iron Age*, New York.

BRASS FOUNDRY WORKING FOREMAN, familiar with mixing of metals for all purposes; give references and salary; **TOOL MAKERS,** give references and salary. Address **Lynchburg Hardware-Mfg. Company,** Lynchburg, Va.

MELTER; first-class experience making steel for steel castings, acid process. Address, stating fully past experience and salary required, **American Steel Casting Company,** Chester, Pa.

A first-class **HARDWARE SALESMAN** to travel on the Pacific Coast for a leading Pacific Coast jobbing house to sell a full line of heavy and shelf hardware; must be strictly temperate and industrious; single man preferred; state age, previous experience, salary and inclose photograph and credentials. Address **M. A. C. Damascus,** 2428 Pine street, San Francisco, Cal.

A young and capable man wishing to advance, who can handle men; must have some experience with dies, bending, punching, &c.; state age, experience and wages expected. Address **Forge Foreman,"** care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

A young, bright **STEEL SALESMAN;** one familiar with high grade materials preferred. Address, with particulars, "Steel Salesman," care *The Iron Age*, New York or Chicago.

Young man with some knowledge of heavy hardware as **ASSISTANT BUYER** for commission house in Pittsburgh; state age, experience and salary expected. Address "Heavy Hardware," care *The Iron Age*, New York.

By a jobbing hardware house in New York City a man as **CITY BUYER** and **MANAGER** of sales department; please state experience and salary desired; applications will be treated in confidence unless acted upon. Address "Jobber, 53," care *The Iron Age*, New York.

For the Philadelphia office of a large steel manufacturing concern a young man of good appearance, having some experience in office work, as well as selling in the line of sheets, bars and shapes. Address with full particulars, stating experience, salary wanted, with references, which must be first-class, "Iron and Steel," care *The Iron Age*, 117-119 South Fourth street, Philadelphia, Pa.

OFFICE MANAGER by a Cleveland manufacturing company; must be diplomatic and posted on best methods of office work, and be competent to take full charge; one acquainted with hardware manufacture preferred; state age, experience, salary expected, references, and when duties could be assumed; all correspondence will be held in strict confidence. Address "Office Manager," care *The Iron Age*, The Cuyahoga, Cleveland, Ohio.

An experienced **DRAFTSMAN** in conveyor and elevator engineering; also several first-class **STRUCTURAL STEEL DRAFTSMEN;** state age and terms. Address **Heyl & Patterson,** Pittsburgh, Pa.

Foreign Representative

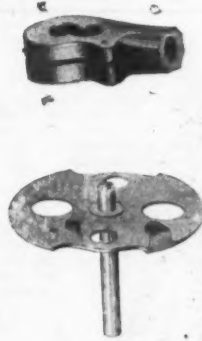
Wanted—Agent who can sell Babbitt Metal in Mexico.

MARKLE LEAD WORKS,

720 Rialto Building,

St. Louis, U. S. A.

"Franklin Metal" Castings.



Our castings come from the mold complete and finished and do not need any further fitting. These cuts are reduced one-third.

SEND FOR YELLOW BOOK.



H. H. FRANKLIN MFG. CO.
SYRACUSE, N. Y.

208 So. Geddes St.

SPINNING BRASS, STEEL, ALUMINUM or any Old Metal.

Sheet metal articles of any kind. Press work. Inventors' sheet metal models. Difficult work our specialty. Write us.

Address, SHEET METAL DEPARTMENT,

THE GOODWIN & KINTZ CO., Winsted, Conn.



OUR line comprises 18 Models, from a two passenger Runabout to a nine-passenger Break, all guaranteed mechanically and electrically. We remove all doubts as to efficient durability by supplying a contract to maintain battery for five years.

Catalogue for two 2c. stamps.

AMERICAN BICYCLE COMPANY,
WAVERLEY FACTORY,
INDIANAPOLIS, IND., U. S. A.

NEW YORK OFFICE, 941 EIGHTH AVE.

Locations for Industries.



The Chicago, Milwaukee and St. Paul Railway Company has all its territory districted in relation to resources, adaptability and advantages for manufacturing, and seeks to secure manufacturing plants and industries where the command of raw material, markets and surroundings will ensure their permanent success.

A number of new factories and industries have been induced to locate—largely through the instrumentality of this company—at points along its lines.

The trend of manufacturing is Westward. Confidential inquiries are treated as such. The information furnished a particular industry is reliable.

Address

LUIS JACKSON,
Industrial Commissioner, C., M. & St. P. R'y
690 Old Colony Building, Chicago, Ill.

Big Four Route

Through Vestibuled Trains Daily.

Cincinnati,
St. Louis,
Indianapolis
to
New York.
Indianapolis,
Cincinnati,
Louisville
to
Chicago.

M. E. INGALLS, W. J. LYNCH, W. P. DEPPE,
Pres. G. P. & T. A. A. G. P. & T. A.
CINCINNATI.

\$1,000
or
\$1,000,000

It makes no difference how large or small a property is, we guarantee an exact appraisal.

What is your plant worth in detail at present market prices?

How much would it cost to replace it completely?

Can you tell accurately how much insurance you can legally carry on it?

Can you tell how much insurance you could collect in case of a complete loss?

These questions are vitally important to all owners, stockholders or investors. The American Appraisal Co. can answer them.

We furnish complete and accurate invoices, inventories, and plans of manufacturing plants, mills and all properties guaranteeing absolute proof of loss in case of fire and correct data for carrying insurance. Invaluable in securing loans. We can refer you to the following and many others: The American Bicycle Co. for whom we have appraised 125 plants. C. J. Smith & Sons Co., Milwaukee, Wis. Fairbanks, Morse & Co., Chicago, Ill. Janesville Machine Co., Janesville, Wis. We will call upon you or write you. Send for our book of particulars.

THE AMERICAN APPRAISAL CO.

OF MILWAUKEE.

Capital Stock \$100,000

Eastern Department

804 Park Row Bldg., New York

Telephone 3744 Cortlandt.

...Japanning...

We do Japanning on all classes of goods and guarantee satisfactory results. Prices named upon receipt of samples of the articles, and advice as to quantity and requirements.

The Warner Brothers Co.,
BRIDGEPORT, CONN.

ELECTROTYPES OR STEREOTYPES

WHEN YOU WANT GOOD ONES, ORDER FROM
BRIGHT'S "OLD RELIABLE"
ST. LOUIS ELECTROTYPE FOUNDRY
911 N. THIRD ST. ST. LOUIS, MO.

REPRESENTATION DESIRED.

Iron and Steel, Machinery, Mill Supplies, etc.

BRITTON & BRITTON,

Garfield Bldg., CLEVELAND, O.

CORRESPONDENCE SOLICITED.

IRON ORES.

G. A. LONGNECKER,

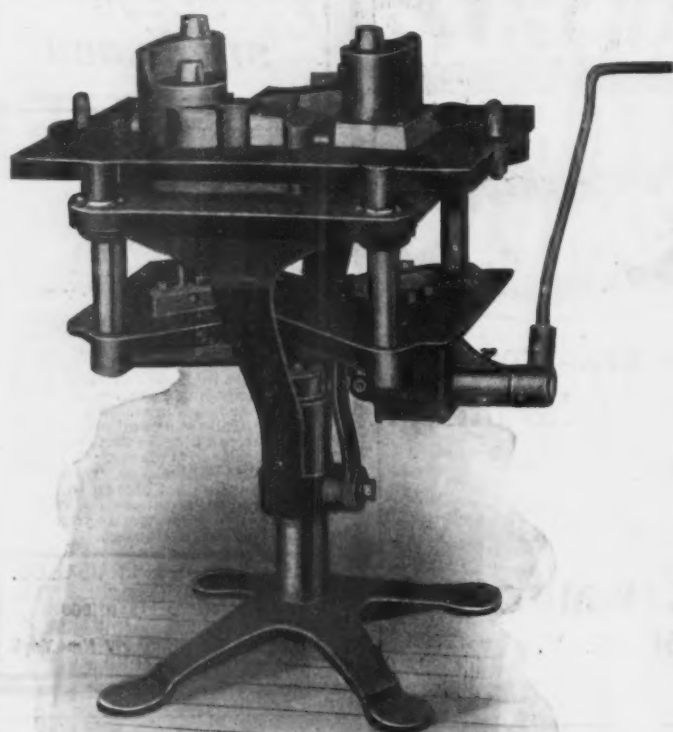
Coe Hill Mines,
ONTARIO, CANADA.

BRITISH MARKET.

SHELBY & CO., 66 Leonard St.,
LONDON, E. C.

Are in shape to push Engineering and Hardware specialties on above market.

CORRESPONDENCE INVITED.



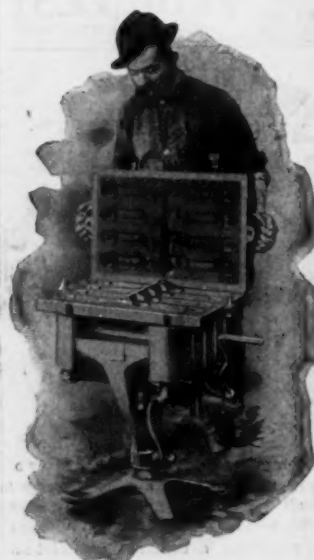
WEISS MOLDING MACHINE

**Simplest,
Best,
Most Economical.**

We are shipping machines
all over the world and every
one is a success.

*When run to their full capacity these machines pay
for themselves in 90 days. Can you save more money in
any other department of your works?*

Adapted to all classes of foundry mold-
ing where there is a large duplication from
a given pattern. Different patterns may
be placed on one set of machines and
changes from one pattern to another made
easily and quickly. Write for particulars
and descriptive pamphlet.



He puts up 200 flasks per day.

MAYWOOD FOUNDRY & MACHINE CO.,

505-507 Monadnock Block,

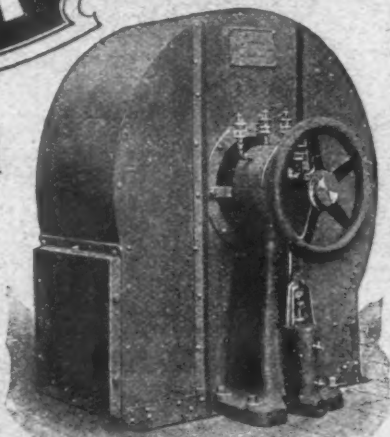
CHICAGO, U. S. A.

THE WORLD'S **BUFFALO** **FORGE** **STANDARD.** **COMPANY**

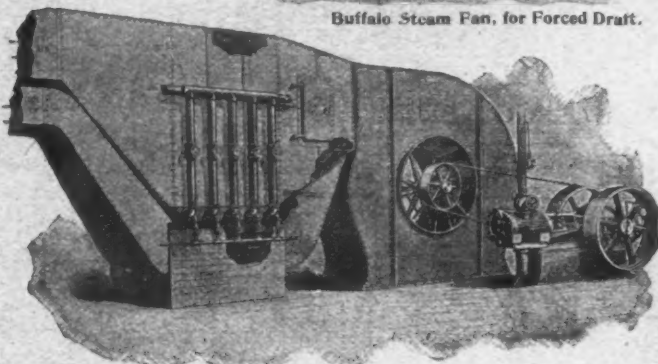


Buffalo Induced Draft Fans with Double Engines.

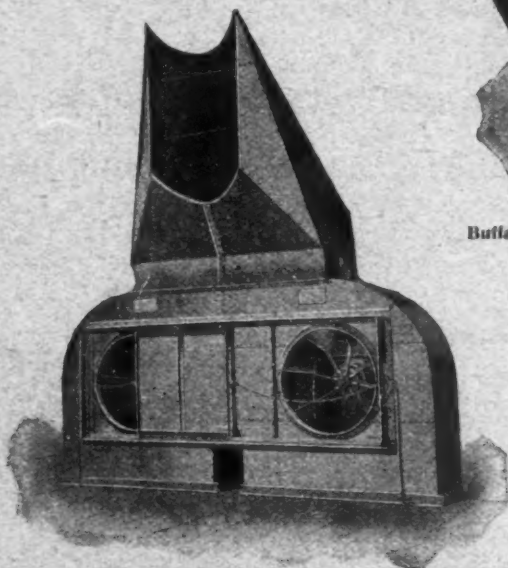
Mechanical
Draft,
Heating AND
Ventilating



Buffalo Steam Fan, for Forced Draft.



Buffalo Fan System of Heating and Ventilating, Double Duct Apparatus.

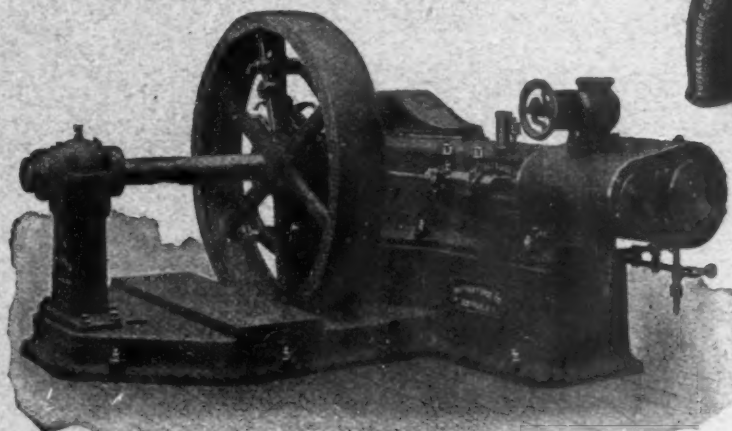


Fans for Induced Draft, designed for Special Conditions.

New Cata-
logues illus-
trative of
Latest Appar-
atus on
Application.



Buffalo Down Draft Forge.



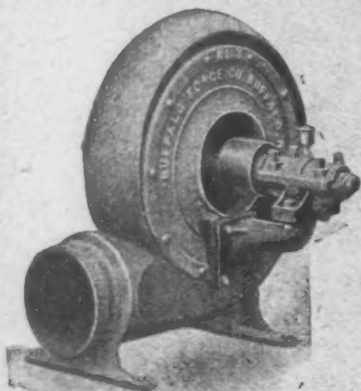
Buffalo Horizontal Center Crank Engine, for Direct Connection to Generator.

**BUFFALO
FORGE
COMPANY,**
Buffalo, New York.

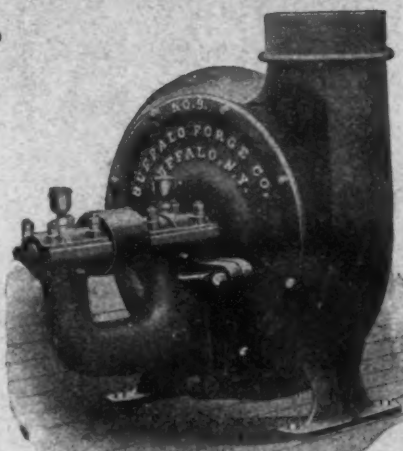
THE IRON AGE.

"BUFFALO"

America's
Best
Blowers and
Forges.



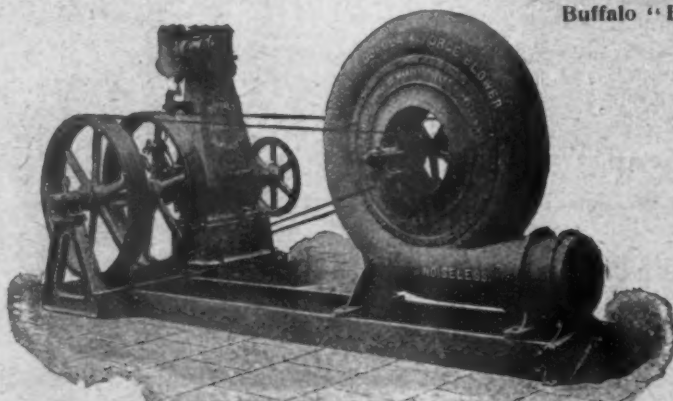
Buffalo "B" Volume Blower.



Buffalo "B" Exhaust Fan.



Buffalo
Machinists' Forge.



Buffalo Steel Pressure Blower on Adjustable Bed, with Engine and Countershaft, for Cupola Work.



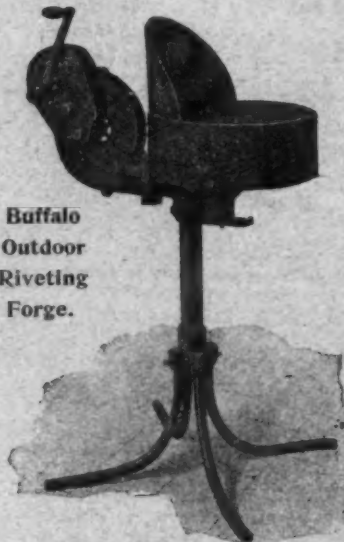
Buffalo Hand
Blower.



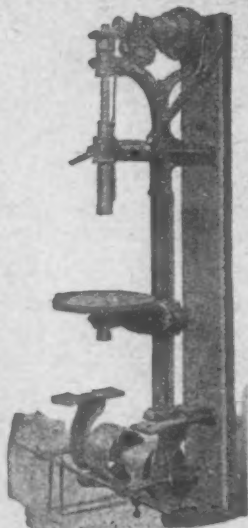
Buffalo
Blacksmiths'
Forge, with Tank.



Buffalo Punch, Shear
and Bar Cutter.



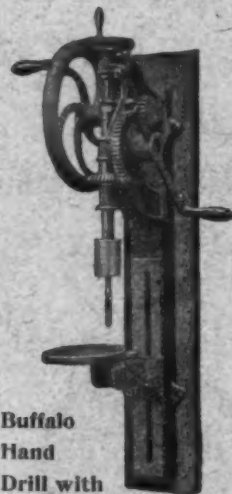
Buffalo
Outdoor
Riveting
Forge.



Buffalo Power Drill
with Back Gear.



Buffalo Boilermakers' Forge.



Buffalo
Hand
Drill with
Automatic Feed.

BUFFALO FORGE COMPANY,

BUFFALO, NEW YORK.



SHEET METAL

Pres

AM

of
S
to
H

M
S

Y
S

BICYCLE BELLS.

MOSSBERG

WRENCHES.

SHEET METAL

STAMPINGS

FROM SHEET METAL TO ORDER.

DIES, PUNCHES AND SPECIAL MACHINERY.

SEND SAMPLE OR DRAWING FOR ESTIMATE.

We have a new modern plant. Prompt delivery and fair prices.

FRANK MOSSBERG CO., Attleboro, Mass.

FRANK MOSSBERG CO., Attleboro, Mass., U. S. A.

STAMPINGS.

SHEET METAL STAMPING.

Press Work a Specialty.

Use your Dies or make Dies for you.

Don't think because we are in the West we can't do it, but send sample or sketch for prices.

AMERICAN HARDWARE MFG. CO.,

Ottawa, Ills.

SHEET

of every description.
Send samples or drawings for estimates.

METAL

BICYCLE FITTINGS,
FERRULES, FLOOR and
CEILING PLATES, Etc.

STAMPINGS

HOUGHTON & BUXTON MFG. CO., - Worcester, Mass., U. S. A.

METAL
STAMPING.Dies, Punches,
Metal Stamping,
Send sample or
sketch for prices.

E. KONIGSLOW & BRO.,

110 SENECA ST.,
CLEVELAND, O.

NOTICE.

HARDWARE SPECIALTIES MANUFACTURED

In Brass, Bronze, Copper, Nickel-plated. Oxidized and Japanned Finishes.

Contracts Made for Manufacturing Outright, or Finishing Alone Dies, Punches, and Metal Stamping
with Extreme Accuracy.

FINEST WORK IN THE WORLD.

CHANTRELL TOOL CO., - - READING, PA.

We do
Special Stamping,Light or heavy, rough or finished.
Send samples or drawings for estimate.

WHEELING HINGE CO., - Wheeling, W. Va.

STAMPING

—AND—
SHEET METAL

WORK

CLEVELAND STAMPING & TOOL CO.,
CLEVELAND, OHIO.

THEODORE THOMAS,

Manufacturers' Agent,

11 Broadway,
New York City.

CORRESPONDENCE SOLICITED.



BUY THE BEST.
"ECLIPSE" and "ST. LOUIS"
Shoe Stands and Lasts, Shoe
Hammers, Foot Rests,
Saw Clamps.



Write for Net Prices.

JOHN C. KUPFERLE, - St. Louis

F

MARKLE DYNAMO METAL.

FINEST QUALITY.



Designed for High Speed Machinery and also for Heavy Bearings where the BEST quality is wanted.

Per lb., \$.40

MARKLE MERIT METAL.

HIGH GRADE.



Suitable for Heavy or Light Machinery. For general use the best Babbitt Metal on the market. We guarantee this Metal to give satisfaction wherever used.

Per lb., \$.25

MARKLE'S EUREKA BABBITT.



A First-class Anti-Friction Metal for general use. Will compare favorably with the best anti-friction metals on the market.

Per lb., \$.18

A complete line of medium and cheap Babbitt Metal and all grades of SOLDER. Special Metals Matched, and All Kinds of Alloys Made to Order.

Full satisfaction guaranteed or money refunded.

MARKLE LEAD WORKS, St. Louis, U. S. A.
Makers of Shot, Babbitt Metal, Solder, Bar Lead, Can Wax, Targets and Traps. AGENTS WANTED.

AMERICAN RAILWAY SUPPLY COMPANY.

Manufacturers of
BAGGAGE, HOTEL AND FACTORY TIME
CHECKS, METAL FIGURES AND LETTERS
AND EVERYTHING IN THE LINE OF
STAMPED METAL WORK.
24 PARK PLACE, NEW YORK.

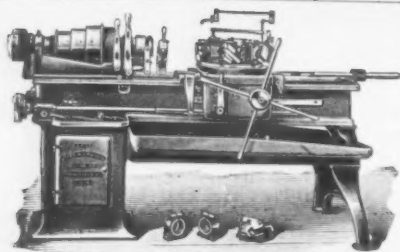
PRESSED METAL WORK.

Light and Heavy Plates
Cut to Shape.Sole Mfrs. of "NEVER-BREAK" Goods.
THE AVERY STAMPING CO.,
Cleveland, Ohio.

S MALL ADVERTISING "SLIPS," to enclose with your regular correspondence, cost nothing to mail, and are most efficient "salesmen." Many an order that gives you "the slip" might have been yours had you given that order-maker a "slip" that called his attention to the goods he bought elsewhere. Every business letter should carry to its recipient some details of what you make or sell. I am constantly making such "slips," especially along mechanical lines. Would you like to see a lot of samples of them?

FRANCIS I. MAULE,
Commercial Literature,402 Sansom Street,
Philadelphia.

SHUN POSTAL CARDS.



The Flat Turret Lathe

Does lathe work accurately
up to 2 in. diameter
by 24 in. long.

JONES & LAMSON MACHINE CO.

MAIN OFFICE AND WORKS:

SPRINGFIELD, VERMONT, U. S. A.

A. B. C. and Lieber's Codes used

ENGLISH OFFICES:

Room 6, Exchange Building, Stephenson's Place,
Birmingham.

26 Pall Mall, Manchester, in charge of
HENRY KELLEY & CO.

PH. BONVILLIAN,
6 Rue Blanche, Paris, France.

GERMANY, BELGIUM, HOLLAND, SWITZERLAND AND
AUSTRIA-HUNGARY:

M. KOEYEMANN,
Charlottenstrasse 112, Düsseldorf, Germany.
AKTIEHOLAGET VERKTUGSMASKINER,
Stockholm, Sweden.

THE W. S. TYLER COMPANY,

Successors to
THE W. S. TYLER WIRE WORKS CO.,
MANUFACTURERS OF

**BRASS, STEEL AND GALVANIZED
WIRE CLOTH,**

Foundry Riddles, Coke and Coal Screens.

W. S. TYLER, PROCTOR PATTERSON,
Pres. Sec. and Treas.
CLEVELAND, OHIO.

The only reasons that higher prices are being constantly paid by the most prominent steam users in the United States for Cahall Boilers are—that they are better made, last longer, cost less for maintenance, show a higher efficiency and make drier steam than any other kind.

Send for illustrated catalogue.

Cahall Sales Department, Pittsburg, Pa

"AMERICAN" TRANSMISSION ROPE.

SEE ADVERTISEMENT
PAGE 6.

ALUMINUM

Ingots, Sheets, Wire, Rods, Castings,
Aluminum Wire and Cables (bare and insulated)
FOR
ELECTRICAL CONDUCTORS.
The Pittsburgh Reduction Co.,
Pittsburgh, Pa.



LOOKING IN

to one of our new Pneumatic Hammers, one cannot help being impressed with the neat and simple construction throughout.

It has no valve to get out of order and will do more work for its size than any other tool. Economical in air consumption and free from vibration.

DRILLS, RIVETERS AND HOISTS
THAT ARE WORTH INVESTIGATING.

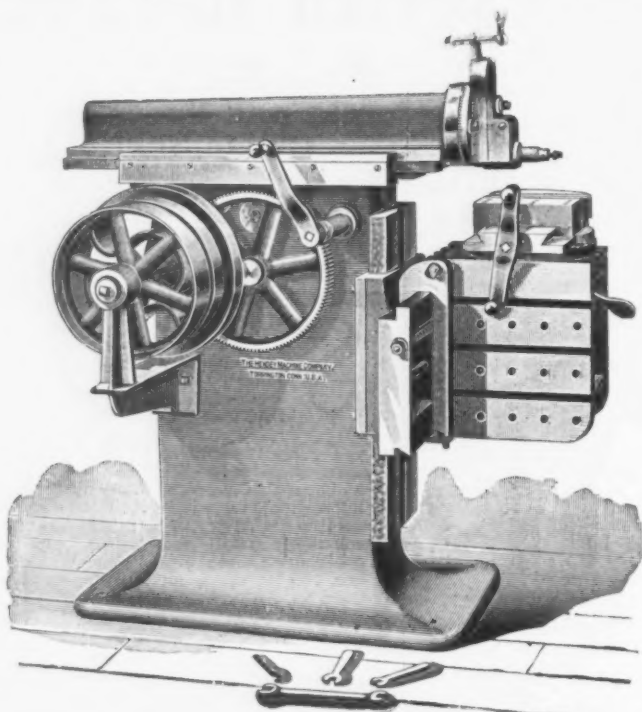
THE Q & C COMPANY,

CHICAGO.

NEW YORK.



20-INCH HENDEY FRICTION SHAPER.



**Our
Very Latest Design,
Embodying
All Improvements.**

STROKE OF RAM, 20-INCH.
CROSS FEED OF TABLE, 19 1/4-INCH.
VERTICAL FEED OF HEAD, 4 1/4-INCH.

THE HENDEY MACHINE CO.,

TORRINGTON, CONN., U. S. A.

U. S. AGENTS:

Hill, Clarke & Co., Boston; Manning, Maxwell & Moore and The Garvin Machine Co., New York; J. W. Cregar, Philadelphia; U. Baird Machinery Co., Pittsburg; The E. A. Kinsey Co., Cincinnati; Manning, Maxwell & Moore, Chicago; Pacific Tool & Supply Co., San Francisco.

EUROPEAN AGENTS:

Schuchardt & Schutte, Berlin, Vienna, Brussels, Stockholm, St. Petersburg, Chas. Churchill & Co., Ltd., London, Birmingham, Adge Janssens, Paris. Stussi & Zweifel, Milan, Italy.

THE IRON AGE.

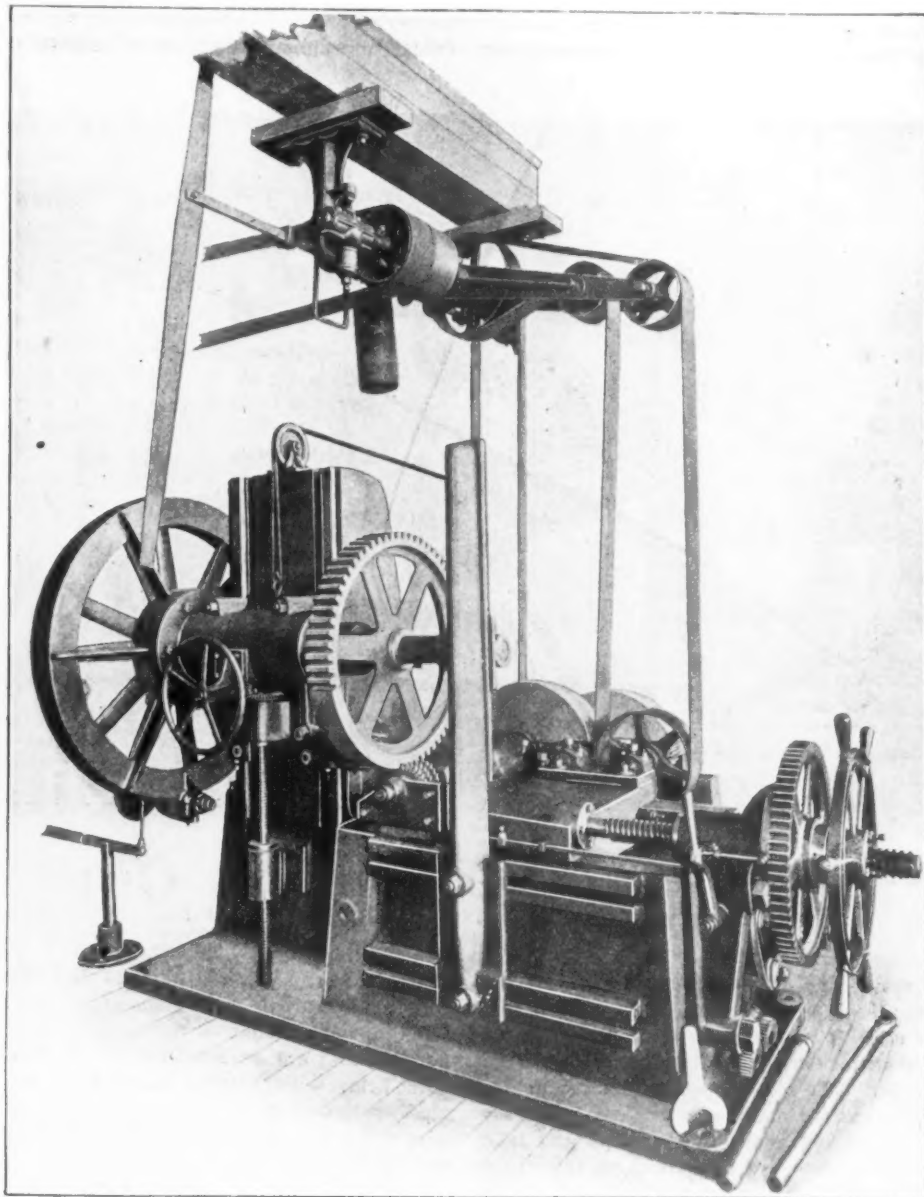
THURSDAY, MAY 3, 1900.

The Pawling & Harnischfeger Crane Works.

Pawling & Harnischfeger, Milwaukee, Wis., who make a specialty of traveling cranes, have recently greatly enlarged their facilities. This increased capacity

has been given regarding the old part of the works as well as the new addition which has just been made.

The old shop occupies a ground space of 100 x 140 feet, and is three stories high. It is located on the northeast corner of Clinton and Oregon streets. The ground floor of this building is partly used as a tool room and partly for the erection of crane trolleys. A 6-ton elec-



Gear Cutter.

THE PAWLING & HARNISCHFEGER CRANE WORKS.

has been compelled by the great growth in their business and the prospects of its continued expansion. The firm have been builders of cranes since 1889. They were, in fact, the first in this country to take up the manufacture of electric traveling cranes. They built the Shaw electric crane for the first two years after that machine was brought out for general use. As this plant has not previously been described in our columns, some facts will

be given regarding the old part of the works as well as the new addition which has just been made. The old shop occupies a ground space of 100 x 140 feet, and is three stories high. It is located on the northeast corner of Clinton and Oregon streets. The ground floor of this building is partly used as a tool room and partly for the erection of crane trolleys. A 6-ton elec-

and is designed to cut wheels of 7 feet diameter, having teeth of 1 diametral pitch or 3 inches circular pitch. The cutter spindle is 4½ inches diameter, forged of high carbon steel, and is geared and belted to pull in regular work a cut of 20,000 pounds on the teeth of cutters 8 inches in diameter. The spindle carriage is 33 inches long and 8 inches thick, to secure as much weight as possible, and is operated by a 3-inch steel feed screw worked by a bronze nut 12 inches long, back of which is a second nut arranged to take up any play which may develop in the main nut. The excessively heavy carriage and powerful feed mechanism, coupled with a very strong cutter drive, produce a very smooth and determined cutting action and make the output of the machine much larger than they have been able to get from any other machines they have in use. It has proved so satisfactory that they are building a second machine of the same kind.

A bay at the end of this room, which is 25 x 50 feet, is used for building smaller sized trolleys and auxiliary

125 kw. generator for power and a 50 kw. light machine with two extra dynamos for use in case of accident or repair.

The new shop is located diagonally across the street on the southwest corner of Clinton and Oregon streets. This building is 110 x 242 feet in size. Part of it is two story high and part three stories. The portion three stories high is 110 x 125 feet. The lower floor of this building is used mainly for erecting shops. It is conveniently arranged for receiving and delivering by rail. A track of the Chicago, Milwaukee & St. Paul Railroad passes through one end of the building and a track of the Chicago & Northwestern Railroad passes through the other end. Thus cranes can be loaded directly on cars under roof by the large electric traveling cranes which cover this floor. The north erecting floor, Fig. 2, which is 38 x 242 feet in size, is covered by one 15-ton and one 10-ton electric traveling crane, and is used for assembling the girders and various bridge parts and for dismantling the cranes for shipment. The south erecting floor, which is

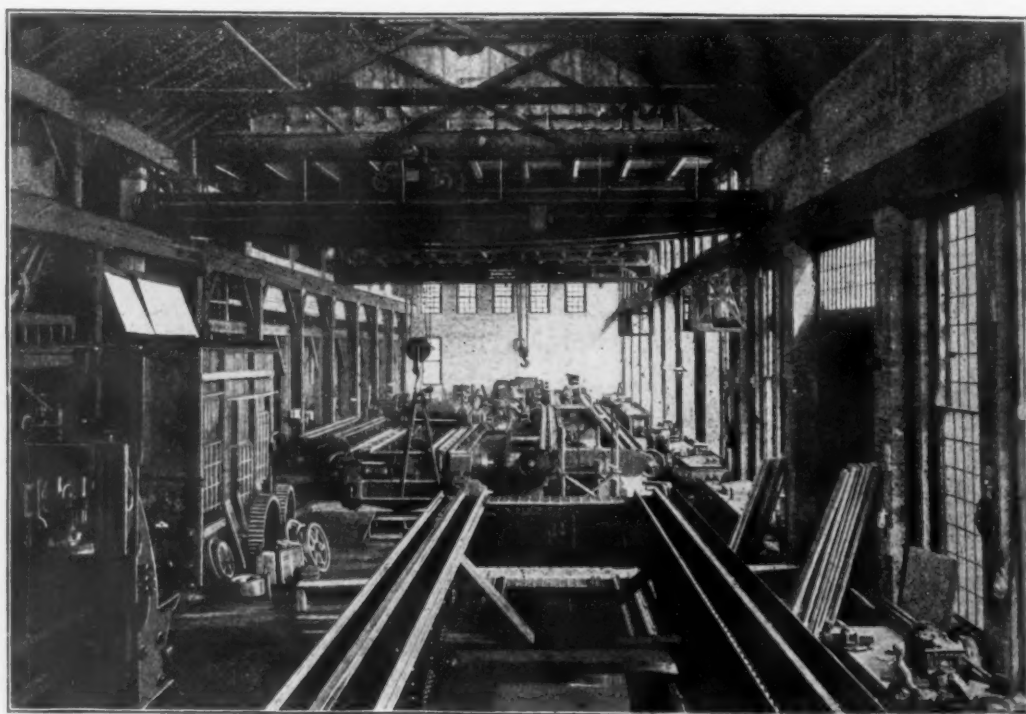


Fig. 2.—North Erecting Floor.

THE PAWLING & HARNISCHFEGGER CRANE WORKS.

hoists, and is covered by a 3-ton electric crane. On the side of the main room and opening directly into it is a shed which is used for the storage of all raw material, and into which castings are brought and taken in charge by the storekeeper. The second floor is used for lighter tools, mainly gear cutters, and is specially devoted to the manufacture of steering gears for tugboats and lake steamers. Electric hoists are also built on this floor. The bottom blocks and load brakes are built in lots of a dozen. The top floor is devoted to the pattern shop and drawing room.

In the rear of this building is the power plant, which has just been improved and greatly enlarged. It consists of a fire proof structure, 50 x 50 feet, containing two Milwaukee Boiler Company's 150 horse-power horizontal boilers, a Crawley heater, a Prescott steam pump for regular service, a Reynolds-Corliss 200 horse-power engine for ordinary use, and a Nordberg 75 horse-power engine to be used in case of accident or repair. The power is directly used for generating electricity, the machinery in the shops being arranged in groups and driven by independent electric motors. The electric plant in the powerhouse consists of a Milwaukee Electric Company's

43 x 125 feet, is covered by a 20-ton electric crane and contains a railroad track running the full length of the building, which enables the large girders to be easily handled that are intended for use in making very long crane bridges. Part of this floor is used for making shafting, especially the long bridge truck shafting. Considerable machinery has been installed on this floor for convenient use in making trolleys. Among the tools are a double head planer, 60 inches by 16 feet, and a 5-foot boring mill, each run by its own motor.

Some special machines, designed and built in this establishment, are among the most serviceable part of the equipment. One of these machines is a double boring machine, Fig. 5, for boring out trolley sides, boring both ends at the same time. Another is a horizontal drilling and boring machine, Fig. 6, which has proved to be an extremely handy tool adapted to a wide range of work, the drill holder being easily adjusted up and down a vertical post to suit the work upon which it is employed. These tools are designed to be used either as fixed or portable machines to do such drilling and boring as cannot be equally well done by regular boring and drilling machines because of the special shape of the work. As

shown in the illustration, both tools are placed on large floor plates on which they can be shifted to reach any part of the work. Each machine has a seat cast on the spindle bracket for a 1 horse-power motor, when so used. The spindle for driving the drill or boring bar is 2½ inches in diameter, has a worm and wheel drive and an automatic movement of 12 inches with the usual range of feeds.

The greater number of the machines operated on this floor are grouped in a central space, 40 x 125 feet, between the two erecting floors, and thus conveniently located for either. Additional machinery is shortly to be installed here for cutting gears. Above this space is a gallery floor, used as a storeroom for electric supplies, wire, machinists' tools, &c., which is conveniently reached by an elevator.

The second floor is used for building motors. The motors are tested here up to double their capacity, and a 2-ton electric crane covers half of this floor and the heaviest tools, which comprise planers, lathes and all

Automobiles for exhibition will be admitted into Austria-Hungary free of duty. Intending exhibitors are desired to apply as soon as possible to Le Comité Exécutif de l'Exposition d'Automobiles, 1, Kärnth-Nerring, 10, Vienna.

The Occurrence, Treatment and Application of Graphite.*—II.

BY W. F. DOWNS, E. M., GENERAL MANAGER FEDERAL GRAPHITE COMPANY.

The countries whose governments officially report the occurrence and production of graphite are Austria, Canada, Ceylon, Germany, Great Britain, India, Italy, Japan, Mexico, Russia, Spain and the United States. Figures collected from these various reports for several years show the present average output of graphite of various grades to be upward of 50,000 tons annually. As some producers of graphite are loath to report their output accurately, it is probable that 60,000 tons per annum would not be an overestimate of the total yearly

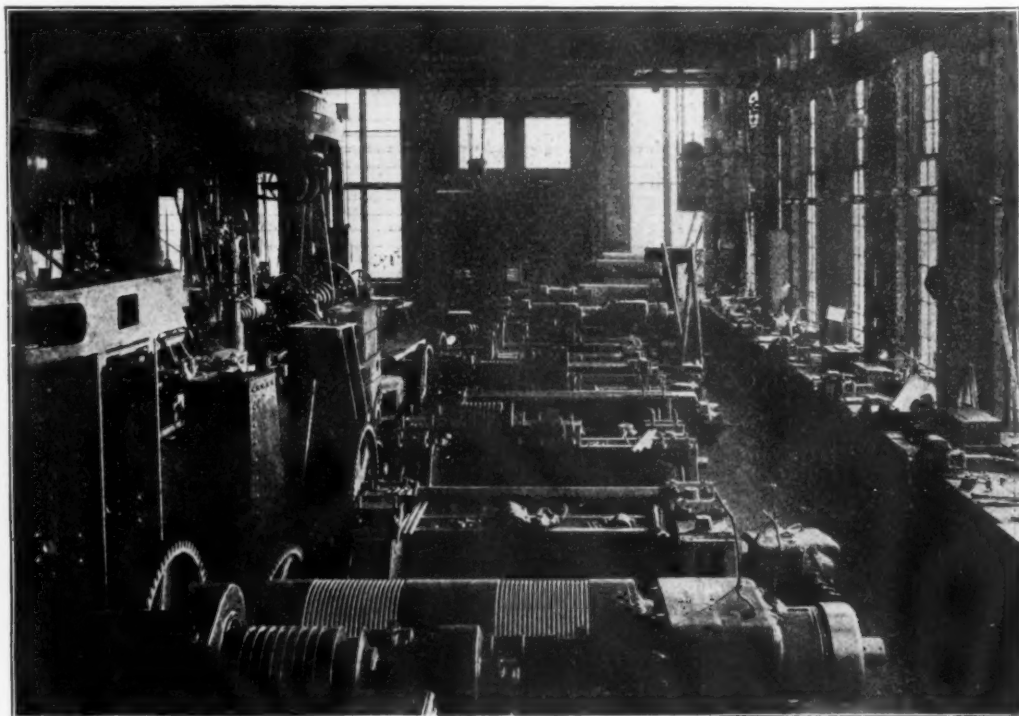


Fig. 3 Erecting Floor for Trolleys.

THE PAWLING & HARNISCHFEGGER CRANE WORKS

other tools necessary to build motors. These machines are placed in the center. On one side of this room the frames of the motors are made, and on the other, shown in Fig. 4, the controllers and rheostats are manufactured and the armatures are wound. The top floor is used for putting cages together, and also for carrying a stock of armatures and other parts used in the construction of standard cranes. The stock of parts carried is so large that anything desired can be shipped on receipt of the order.

All trolleys are built in lots of 6 of the larger and 12 of the smaller. Everything is standard. The gears and smaller parts are made up in large lots. The parts are interchangeable, so as to give as little trouble as possible in making repairs or renewing parts.

The plant is heated throughout by the hot air fan system. With the improvements and enlargements which have recently been made the firm are now in a much more advantageous position to meet the demand for their specialties.

An international exposition of automobiles is to be held in Vienna, Austria, from May 31 to June 10 next.

output of all grades of graphite, plumbago or black lead produced in the world. The most recent authentic figures of production are as follows:

World's Production of Graphite (in Metric Tons).

Year.	Austria.	Canada.	Ceylon.	Germany.	Great Britain.	India.	
1893.....	23,807	Nil.	21,900	3,140	Nil.	(a)	
1894.....	24,121	63	10,718	3,133	Nil.	1,623	
1895.....	28,443	199	13,711	3,751	41	(a)	
1896.....	35,972	126	10,463	5,248	Nil.	(a)	
1897.....	38,504	306	(c)	3,861	Nil.	61	
Year.	Italy.	Japan.	Russia.	Spain.	United States.	(b)	Totals.
1893.....	1,465	26	311	Nil.	400		51,383
1894.....	1,575	1,091	(a)	10	350		42,583
1895.....	2,657	77	(a)	Nil.	171		49,050
1896.....	3,148	215	(c)	Nil.	184		55,356
1897.....	5,050	(c)	(c)	(a)	450		48,922

(a) Not reported in the government statistics. (b) Crystalline graphite. (c) Statistics not yet published.

Besides the countries mentioned as producing in the various official reports, graphite occurs in many other places. In fact, it occurs as a mineral quite frequently in the older rocks, although the number of places where it has been mined successfully is comparatively few. Many of these deposits are neglected on account of location, transportation, quality, or richness and extent, but undoubtedly the lack of information regarding

* Copyright, 1900, by David Williams Company.

proper treatment and use is the most frequent cause of such neglect. We will refer to the very able papers of Dr. Ernest Weinschenck of Munich for a discussion of the substance as a mineral. Here we will consider the characteristics of the material as produced in the various countries reported:

Commercially, the market recognizes three grades of graphite. Each of these has its subdivisions according to its polishing power, or the size of its particles, or both. The most important grade is the crystalline. This grade is subdivided according to the kind of crystallization, size of the particles and percentage of carbon. The next grade is the amorphous. Its subdivisions are based on the percentage of carbon contained and the nature of its impurities. The lowest grade is also amorphous, but is not always classified as graphite. It includes those more or less graphitized carbons, such as graphitic anthracite. These lines are not always sharply drawn either in nature or commerce.

Crystalline graphite occurs in massive form in fissure veins or in pockets or disseminated in fine flakes throughout the vein material. The crystals are never perfect, and are sometimes acicular. The Ceylon grades are the

graphite is distinctly crystalline. At times it occurs in large masses of several hundred pounds weight. The associated minerals are mainly siliceous. Fine quartz crystals are occasionally found in the graphite. At times hematite and magnetite are mixed with the graphite in the poorer varieties, the amount of iron running as high as 15 per cent. Small masses of acicular structure like fibrous asbestos are frequently found. The Ceylon mineral is classified in the market according to size, into lumps, chips and dust, and each of these is further divided according to the quality. No systematic classification according to the percentage of graphite contents has ever existed in the Ceylon market. For many years the best black lead or plumbago crucibles have been made from the Ceylon mineral. The Ceylon graphite commands the best price of any variety in the markets, and is used for the largest variety of purposes.

German Graphite.—The graphite produced in various parts of Germany is very similar to the Austrian.

British Graphite.—At present there is no production of graphite in England. The Barrowdale mines were once famous for the production of pencil graphite. This was in the day when the manufacturer of graphite took what

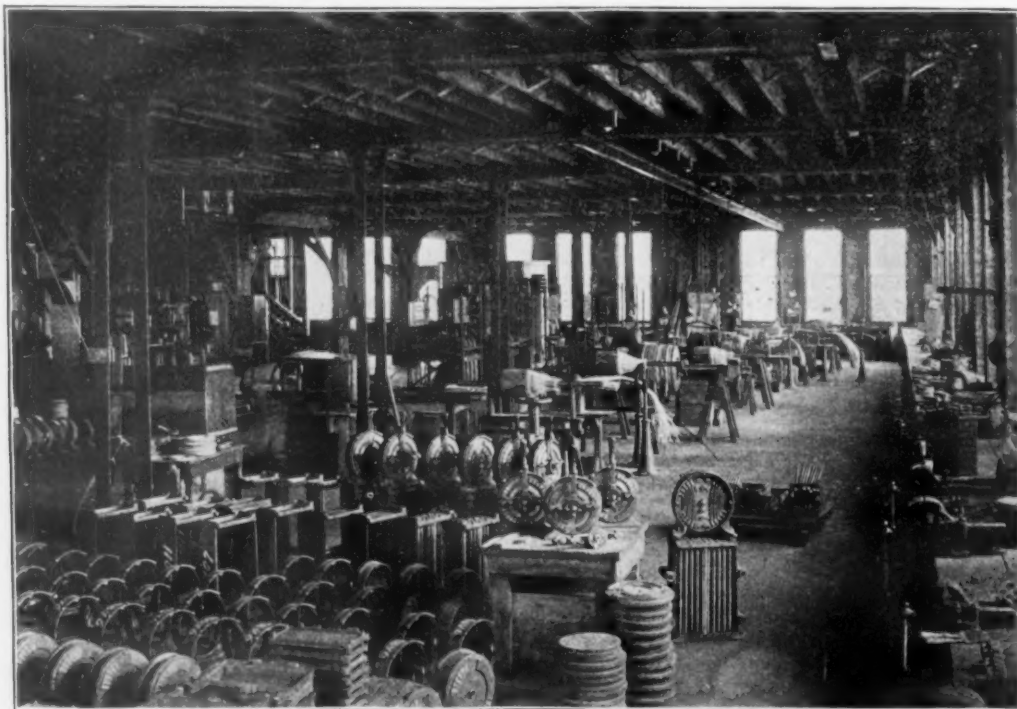


Fig. 4.—One Side of Electric Department—Armature Winding, Rheostats, Controllers.

THE PAWLING & HARNISCHFEGGER CRANE WORKS.

best types. Amorphous graphite occurs mainly in bed-like deposits. It is very fine and soft. These grades show no crystallization to the eye. They form the best source of pencil graphite. Their quality is determined by the percentage and softness of the graphite contained. The last of the three general (commercial) divisions of graphite is practically amorphous also, though, as stated, imperfectly graphitized. It is often high in carbon, but is not soft and unctuous as the typical amorphous grades. Its occurrence is similar to the preceding grade, though the commercial value is much less. The best type of this is the graphitic anthracite of Rhode Island, U. S. A., though several deposits are found intermediate between the Rhode Island mineral and the fine grades of Bavaria. Of the different countries producing graphite, Austria is reported as having the largest output.

Austrian Graphite.—Commercially, Austrian graphite is considered amorphous, though at times grains and small flakes are discernible. This graphite is used for a large variety of purposes. The richest deposits yield fine pencil graphite. It is quite difficult of purification on account of its amorphous character and the decomposed structure of its gangue.

Canadian Graphite.—The graphite occurring in Canada is distinctly crystalline, though some amorphous varieties are reported as occurring in the Ontario district.

Ceylon Graphite.—The most notable and extensive deposits of graphite in the world occur in Ceylon. This

came to him to use. Now, however, the requirements of the pencil maker are very severe, and he inspects, selects and prepares his pencil material with the greatest care, and it is doubtful if the old and once famous Barrowdale product could find a market.

India Graphite.—A variety of graphite from Travancore, in India, has appeared in the market from time to time during the past few years. This variety is crystalline, granular and hard. It is much lower in graphite than the Ceylon mineral with which it aims to compete. It has not yet become a factor in the world's production.

Italian Graphite.—An amorphous variety of graphite has been produced in Italy. It is not as soft as the Bavarian and at times is harsh and granular.

Japanese Graphite.—The graphite produced in Japan is similar to the Italian.

Mexican Graphite.—A very fine granular, almost amorphous, graphite is now produced in considerable quantity in Mexico. A streak of very high grade occurs in this deposit. Samples from this run very high in carbon, and it is used for pencils and other exacting purposes. The balance of the deposit is lower in carbon and is used mainly as a facing in foundry work.

Russian Graphite.—The production of graphite in Russia has practically stopped. The grade produced was amorphous, and at one time had a high reputation as a pencil graphite.

United States Graphite.—The importance of the United States as a producer of graphite is increasing rapidly.

All varieties occur in the country, although the crystalline grades are not as massive or rich as the Ceylon, nor the amorphous grades as fine and soft as the Austrian. In the United States, however, more attention has been paid to the preparation of the mineral from its ores and very high results have been obtained. The output is increasing rapidly.

Artificial Graphite.—The graphitization of carbon in the electric furnace has been accomplished by E. G. Acheson of the Acheson Graphite Company, Niagara Falls, N. Y.

Treatment.—In the early days graphite received no treatment preliminary to its use other than selection. As the application of graphite became extended greater care had to be used in this selection. The separation of only the best and purest grades for use meant the large accumulation of secondary grades for which there was but a poor market. If these were used, in many cases it meant the production of poor grade manufactured goods. For many years the methods of preparation for the market were very crude, and improvement has been very slow. In general the producers have tried only to prepare their product just enough to pass the market, and the manufacturer of graphite goods has had to still further select and prepare the mineral for use in his various products.

The physical characteristics of the mineral render its treatment for purification rather difficult. Its closeness in specific gravity to that of its associated minerals allows but a small margin for gravity separation. The specific gravity of graphite is usually given as 2.3. The specific gravity of quartz is usually given as 2.4 and 2.5. As most of the minerals associated with the graphite are not much higher in specific gravity than quartz, the difference in specific gravity of the graphite and its associated minerals ranges from 0.2 to 0.4. This margin in which gravity separation must be accomplished is practically further reduced when the graphite exists in a fine state. It will be noticed also that the graphite is lighter than its gangue. Hence the ordinary processes are reversed. Though graphite is purified to a high degree the amount of strictly pure graphite in the market is comparatively small. Fortunately, for most purposes it does not need to be absolutely pure, as nearly all graphite goods are mixtures. For use in the manufac-

modified by the difference in formation between the particles of graphite and its gangue. Both air and water are used as the media in which to effect this separation.

Treatment for Purification by Air.—This has long been a favorite field for experiment. The thin flat scale of graphite offers more resistance to a current of air than an irregular fragment of gangue. The usual form of

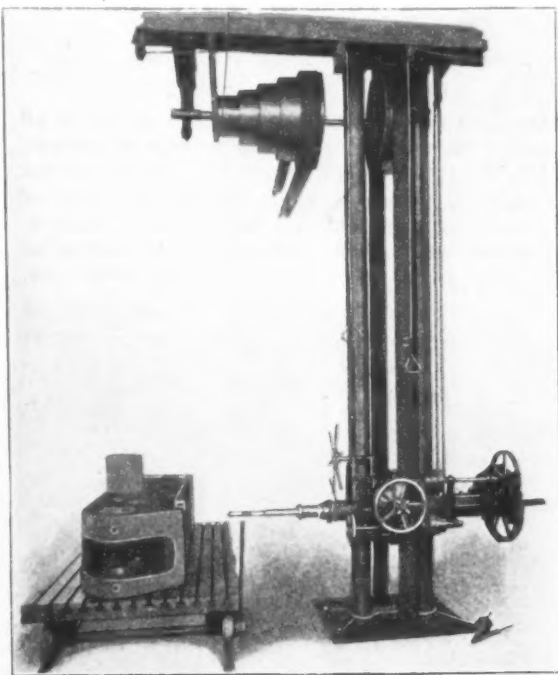


Fig. 6.—Drilling and Boring Machine.

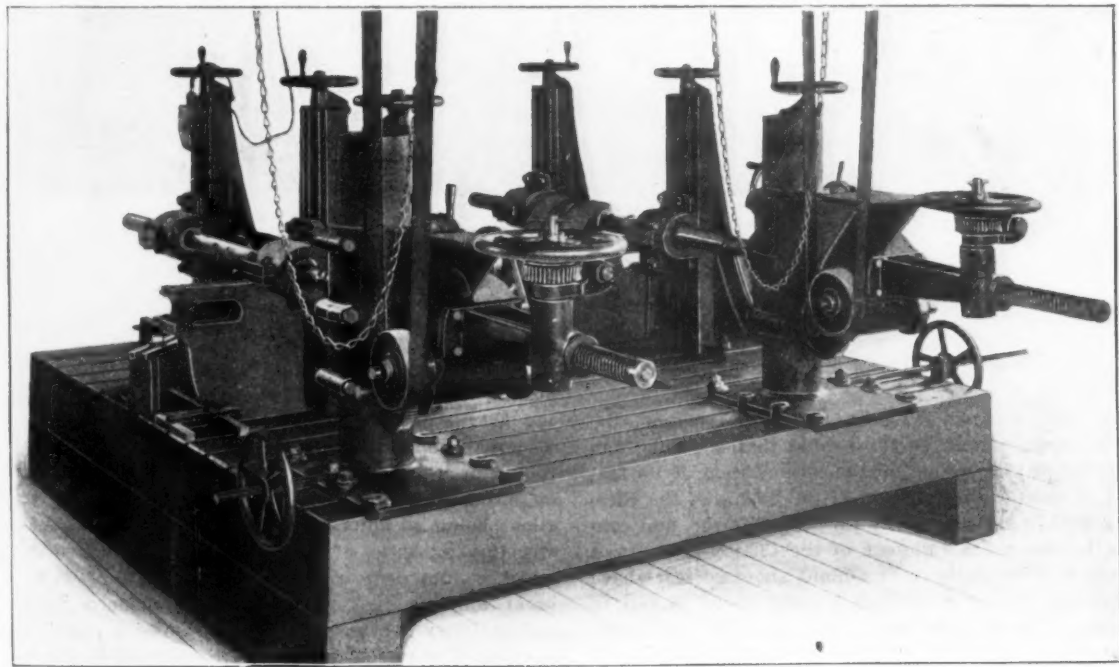


Fig. 5.—Double Boring Machine.

THE PAWLING & HARNISCHFEGGER CRANE WORKS.

ture of electrical goods, lubricants and pencils it needs to be pure. As the other lines consume by far most of the graphite, the necessity of the study of the nature and amount of the impurities present becomes apparent. As carbon is practically chemically combined under most conditions, the changes which take place in a graphite mixture are usually due to the impurities. The methods employed in the preparation of the graphite are all mechanical. These are all based on the difference in specific gravity of the minerals,

air jigs is further supplemented by settling chambers, dust collectors, &c. These machines concentrate, but it is doubtful if they will make any pure graphite. Though frequently tried they have never come into general use.

Treatment by Water.—The amorphous grades are levigated on a large scale in Europe. This method frees the ore of coarse particles, but the earthy impurities carry over to the last settling vessel and much remains with the graphite. Even when the washing is carried to the extent that filter presses are used, clayey impurities still

follow the graphite. The crystalline varieties occurring in the gneiss and schistose rocks are the most susceptible of treatment. These are crushed to a fineness sufficient to disassociate the graphite from the gangue, and first separated in buddles. This separation is of course incomplete, but when supplemented by sizing, regrinding, floating, &c., is carried to quite a high degree. These methods have attained great perfection in the United States.

The Paris Exposition.

EDITORIAL CORRESPONDENCE.

PARIS, April 10, 1900.—There is furious activity in all sections of the Exposition grounds in order to get matters into some fair shape. To-morrow is to be the last day before the formal opening for the admittance of exhibitors' goods, and then the balance of the week is to be devoted to a general cleaning up, the removal of empty cases and flooring over aisles. Then, next week,

the designs of M. Girault. The main entrance, flanked by fine groups of statuary, gives access to a rotunda lined with handsome marble and surmounted by a glass dome. Right and left, along the façade, extend two long galleries. The most striking feature, however, is an open court, bounded by a semicircular colonnade, entered by two arched doors. The court is occupied in part by three porcelain lined basins, hemmed in by bright mosaics, and conforming in a general way to the semicircle of the colonnade. Heightened by a frieze, partly gilt, and by gilt statuary, the effect is admirable.

The two main galleries along the façade end in rotundas for staircases, and from them there stretch two semicircular galleries, in which exhibits are being installed, the one receiving its light from the court, and the other from the flanks of the building.

The large Palace of Beaux Arts occupying the other side of the wide causeway has a main entrance, subdivided by two groups of two pillars, the main façade

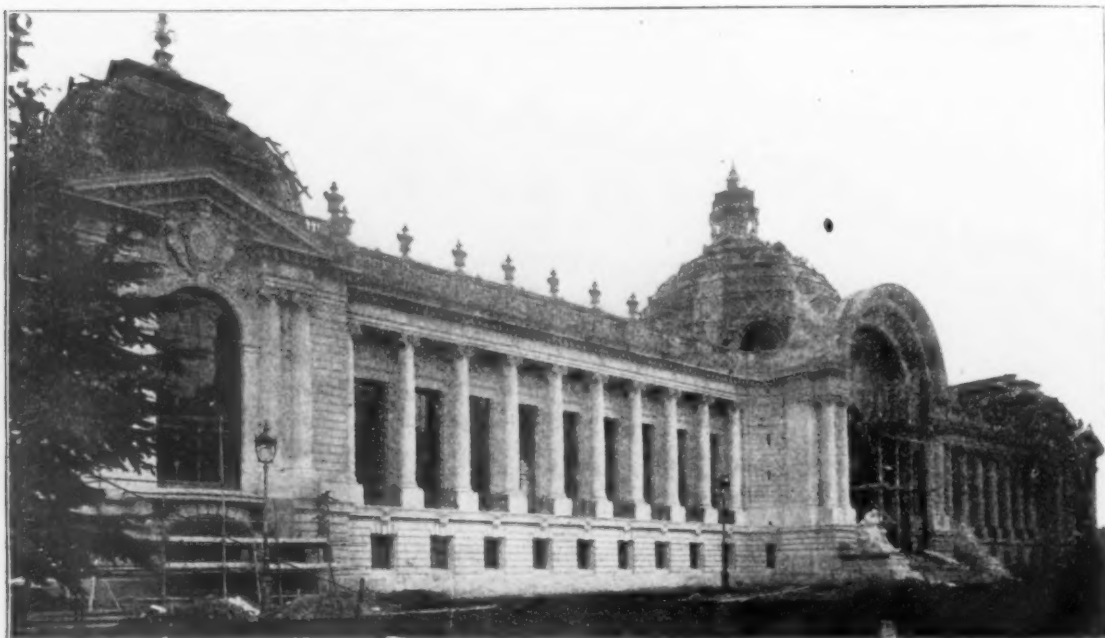


Fig. 1. Small Palace of Fine Arts.

THE PARIS EXPOSITION.

the work of installation will go on merrily, and for many weeks to come.

The one sensational feature of the Exposition, the Water Castle, is still so far behind that a photograph would fail to convey an adequate conception of its features. From the second story of the façade of the Electricity Building, which faces the Eiffel Tower, and connects the two main buildings of the Champ de Mars, a cascade of water falls from a height about 90 feet above the general ground level from a niche about 75 feet in diameter. This is to be illuminated at night with varied bright colors, and will undoubtedly produce extraordinary effects. From a grotto back of and through the falling sheet of water the Eiffel Tower, and, in the distance, the Trocadero, will be visible.

One of the most beautiful groups, likely to prove most attractive to the general visitor, will be the two Art Palaces, with the magnificent Alexander III Bridge, and the series of buildings on the other bank of the Seine beyond, the center of the picture in the distance being the gilded dome of the Invalides.

The two Palaces of Fine Arts are practically complete. Both of them are permanent structures. Our illustrations, Figs. 1 and 2, show the small and the large palace, respectively. The former, which is to house an historical display of French art, was built from

having a series of columns masking it. The frieze is ornamented by a series of enamel mosaïques, representing art in Assyria, Egypt, Rome, Greece, Arabia, &c. The main building consists of an elliptical main hall, roofed by a splendid steel structure, from which extend on either side great roofed transepts and a nave, the whole being an admirable example of modern steel construction. A series of salons are arranged in two stories, which communicate with the roofed court. It is in this great building that the exhibits of modern paintings and statuary are to be installed. Quite a considerable number of works of sculptors are collected in the court, ready to be placed in position.

The Alexander III Bridge, shown in Fig. 3, is an admirable example of the combined efforts of the engineer and the architect, the former represented by Résal and Alby and the latter by Cassien-Bernard and Cousin. The bridge, which has a span of 342 feet, consists of 15 steel arches built up of steel castings, their total weight being 2200 tons. Hammered copper groups, not yet in place in the picture, are to mask the key of the arch. Ornamental pillars, with large gilt equestrian groups and a series of exceedingly handsome figures, give the whole an admirable finish.

Standing on the bridge, the view of the Exposition buildings along the Esplanade des Invalides is well

shown in Fig. 4. They consist of two wide structures parallel to a main thoroughfare, with the dome of the Invalides in the background, as indicated in the photograph. Near the bridge there is a widening of this lane, the end façade being marked by the four turrets shown, which consist of a cupola upheld by four groups of female figures. The faces of the narrowed structures nearest the bridge are ornamented with four large, bright mural paintings, and generally the dazzling white is relieved by patches of color and by gilding.

The whole of the buildings on the left of the picture have been reserved for French exhibitors of furniture, domestic art, jewelry, cutlery and varied industries, a good deal of space being given to the national industries of Sevres and Gobelins. The buildings on the right side are devoted to similar products of other nations.

The American section in the Mines and Mining Building is progressing well. In the gallery the series of showcases displaying the smaller products of the American Steel & Wire Company are ready for the opening day. H. M. Britton, assistant superintendent of the Pacific

tations having been issued. To an Anglo-Saxon the peculiar inflection of the voices of French speakers and their polished phrases do not seem to produce marked oratorical effects, and the plaudits of the polite throng lack that spontaneity which emphasizes telling sentiments with us. It was interesting, of course, to study the assemblage itself, consisting as it did of all that was great in French bureaucracy, politics, art, literature, science and military circles. The President of the Republic was surrounded and accompanied by a multitude of functionaries, diplomats and representatives of foreign countries, but, after all, the most impressive feature of the ceremony was the splendid hall in which it took place. The central section of the great machinery hall of the exposition of 1889 has been converted into a vast circular auditorium by the erection of a steel dome shaped structure, lighted from the top by a magnificent stained glass dome representing the Milky Way. By the skillful use of staff and an admirable series of mural paintings this Salle des Fêtes has received a charming setting. Although 13,000 people were seated in it at the time of the opening exercises it was not crowded, the main floor being capable of accommodating a large additional number.

Easter Sunday, which happened to be the first charming spring day, brought the first rush of sightseers, the

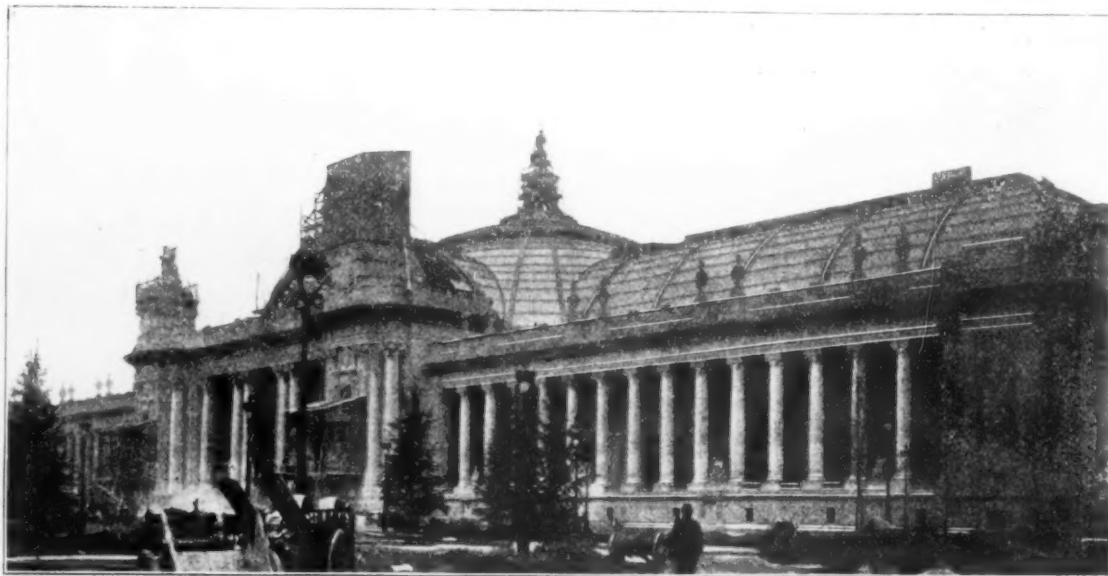


Fig. 2.—Large Palace of Fine Arts

THE PARIS EXPOSITION.

Works, having installed it. The heavier articles on the main floor have been waiting for some time for the pagoda, designed by Winslow Brothers of Chicago, which is now on its way from Havre.

W. C. Cronmeyer, formerly of Demmler, is rushing his exhibit into place, while A. S. Butler of the Crescent Steel Company of Pittsburgh is well along with his display. W. C. Redfield, after a tour of the principal English manufacturing towns, has completed the exhibit of drop forgings produced by the J. H. Williams Company of Brooklyn. C. Bommer of Bommer Brothers, Brooklyn, has his material in place, and the same is true of the John A. Roebling's Sons Company of Trenton, N. J., and of the exhibit of E. C. Atkins, represented by Ed. S. Taylor. John C. Kilgore of the Crane Company, Chicago, has been endeavoring for some time to get two carloads of material into his space. The crowded condition of the tracks is delaying work seriously. In the space occupied by the collection exhibit of *The Iron Age* the showcases are in place and a considerable number of the catalogues are ready to be placed on the shelves.

The Formal Opening.

PARIS, April 17, 1900.—As a ceremony the formal opening of the exposition, which took place on Saturday last, was not particularly impressive. It had none of the elements of a great popular gathering, but was rather a reception to the chosen few, about 13,000 invi-

grounds being opened to the public. It is stated officially that 150,000 people availed themselves of the opportunity to gratify their curiosity as to the real status of the show. The local newspapers, which have studiously abstained thus far from a frank statement of the real state of affairs, in the face of such a multitude of witnesses, acknowledge the facts by admitting that only a very small part of the exhibits is in place. In view of the all pervading dust it seems very unwise, from the standpoint of the exhibitor who has delicate and highly finished goods, to expose them even if placed in inclosed showcases. The great mass of the lighter articles may be rushed into position, and a few weeks will suffice to make bare spaces the exception rather than the rule. All the buildings are now so far advanced toward completion that early May will witness the last strokes of work. Quite a number of the side shows are in running order, but the vast majority of the restaurants are still unable to offer hospitality.

Hotel Charges Advanced.

In this connection it may be well to state that, generally speaking, the Paris hotels have made the opening day a pretext for the raising of their rates, in some instances nearly doubling them. Whether later developments will prove that they have overrated the ability of the traffic to bear the advance remains to be seen. Intending visitors, however, will do well to reckon with the possibility of success on their part.

As yet the lighting of the exposition buildings has only been tentative, and it will take some time, from the condition of the power and generating plants, before this feature of the show has developed sufficiently to judge of the effects to be produced. There are indica-

tions that the straight lines, emphasizing outlines of buildings, will be a frequent feature—a system which advanced practice is inclined to condemn as inadequate and inartistic. That the buildings will be in a blaze of light there is every reason to believe. Nor is it possible as yet truthfully to report, in the absence of the installation of exhibits, to what extent the visitor will be attracted by what is novel, curious, interesting or artistic in the articles to be displayed.

Co-operation of Artists and Engineers.

As a whole, so far as the buildings are concerned, he will be disappointed who expects the classic, almost severe, beauty of the Court of Honor at Chicago. The tones are gayer, the outlines more varied, and occasionally *bizarre*. The triple arch of the Monumental En-

have that grace and beauty which comes from the embodiment of the best means to a useful end. No one can accuse us of being clumsy, but that is only one step, though an essential one, toward perfection. One gathers the impression, which may be strengthened by a later study of the exhibits of other producers, that Americans have most to learn and have an important field for development in this direction.

The Great Hit

of the exposition from a popular point of view is the moving sidewalk, a strip of which, it will be remembered, was in operation at Chicago in 1893. It had been running experimentally off and on during the last two weeks and aroused some attention, particularly when an occasional bicyclist speeded along. But it sprang into

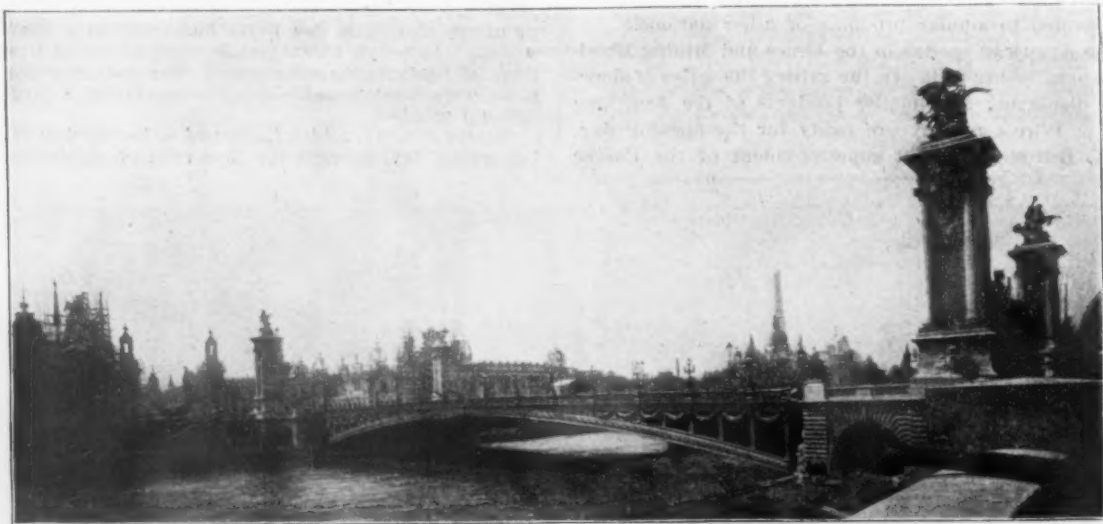


Fig. 3 — Alexander III Bridge.



Fig. 4. — View of the Esplanade des Invalides, Taken from Alexander III Bridge.

THE PARIS EXPOSITION.

trance, with its crowning statue of the modern Parisienne in particular, is the subject of many irreverent remarks. Yet one cannot escape the belief that under the brilliant skies of our own country greater freedom in coloring and in decoration would be appropriate and effective.

A trip along the Seine emphasizes the need in our country of a closer co-operation between the architect and artist with the bridge engineer. The brutally utilitarian character of the vast majority of our structures of this type ought to be softened by the touch of the artist. Public conscience should be awakened more than it is to an intolerance of monstrosity in form and utter lack of decoration in public structures. In many directions Americans have proved their ability to create and appreciate the artistic and the graceful, and development in that direction in one field is sure to operate favorably in branches in which progress aids much toward commercial success in others, particularly when foreign markets are concerned. In tools and appliances our products

instant popularity on the afternoon of the opening day, and seems destined to become a favorite amusement and a common means of travel from point to point. It is installed on a light elevated steel structure and encircles the irregular triangle, along which stretches, on the Avenue de la Bourdonnais, on one side the palace of Mining and Textile Arts of the Champ de Mars; on another the Rue Fabert, flanking the buildings of the Invalides, and on the third the Street of All Nations, &c., along the Seine. Paralleled throughout its length it competes with an elevated electric road and like it gives a good general view from a high point of the buildings along which it passes. Both lines furnish an excellent and convenient means of communication, but evidently the moving sidewalk is bound to secure the lion's share of the traffic of those who are not foot weary. The entire circuit is about 3000 m., or, approximately, 2 miles, and the traveler has the advantage of being able to leave the moving sidewalk at any place to quietly survey his surroundings. The first moving platform, by the side of

the stationary platform, has a very slow motion, while the second platform, slightly higher, travels at a speed of about 5 miles an hour, so that a brisk walk on it causes quite a lively rate of travel. The institution has already been pronounced by the Parisians one of the *clous* of the exposition.

French Workmen.

To judge from the fact that it is a matter of general and somewhat contemptuous comment among the Americans connected with the work here, the capacity and the characteristics of the French workmen must have been the burden of many reports and letters home during the past few weeks. Their deliberate movements, the frequency of their adjournments to *déjeuner* and the length of these meals, the long pauses for conversation and comment, their eagerness for a *pourboire* and their utter irresponsibility as to future engagements have been exceedingly exasperating to those who expected co-operation and sympathy in their eagerness to rush work to completion. From personal observations your correspondent is willing to assent to all these strictures, and the contrast between the French workmen at the exposition and the few American workmen who have come over to aid in installation is indeed very striking. The latter, however, were in all cases picked men.

But admitting all that has been alleged to be true, your correspondent is convinced that a serious injustice may be done to the laborer of our Sister Republic, and that erroneous and therefore dangerous conclusions may be drawn. In matters of this kind it is well to be frank. To begin with, those Americans who have employed French workmen have had no experience in selecting their crews. The majority of them, not having command of the French language, have been unable to handle them effectively. Many have attempted to drive them and have neglected or failed to give them gratuities to which custom entitles them. But, after all, the principal reason why it is unfair to judge of the characteristics of the French workmen from those with whom American exhibitors have come in contact themselves, or have observed at work for others, is that the exposition has gathered together the floating working population of Paris and of the whole of France. That such should be the case is natural enough. Exceptional wages are being paid, and the temptation to visit Paris and the exposition has undoubtedly been a strong factor. The great majority of the men know that their employment is only temporary, and many undoubtedly have been deliberately "soldiering" in order to nurse their jobs. While such an occasion may bring some of the pick of the men, it is quite clear that the great majority must be naturally considerably below rather than above the average of the working population of France. C. K.

The British Iron and Steel Institute.

The annual meeting of the Iron and Steel Institute of Great Britain will be held at the Institution of Civil Engineers, Great George street, Westminster, London, on Wednesday and Thursday, May 9 and 10. The programme for Wednesday provides for the presentation of the report for 1899 by the council, the presentation of the report of the treasurer, William Whitwell, the appointment of scrutineers to examine voting papers, the election of officers and council, the presentation of the Bessemer gold medal to Henri De Wendel, president of the Comité des Forges de France, and a selection of papers to be read and discussed. Thursday will also be devoted to the reading and discussion of papers.

On Wednesday evening the annual dinner of the institute will be held in the grand hall of the Hotel Cecil, under the presidency of Sir William Roberts-Austin. It is expected that among those who will be present at the dinner will be the Right Honorable George J. Goschen, First Lord of the Admiralty; the Right Honorable Lord Kelvin, the Right Honorable Lord Stratheona and Mount Royal, the Honorable Sir Charles Fremantle, the Honorable E. Lyulph Stanley, the Master Cutler of Sheffield, Sir Courtenay Boyle, Sir John Evans, Sir Francis Mowatt, Sir Norman Lockyer, Sir William Abney, Sir Benjamin Baker, Lieutenant-General Geary and the Deputy Master of the Royal Mint.

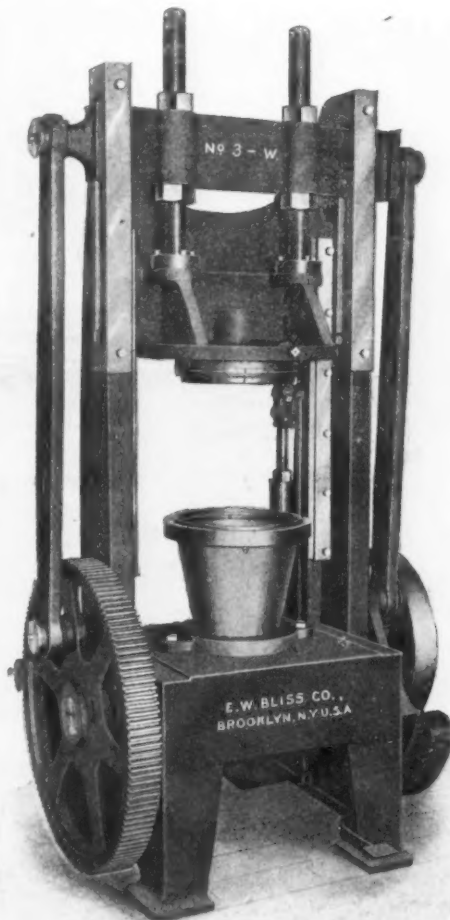
Among the papers to be read and discussed at this meeting are the following: "Ingots for Gun Tubes and Propeller Shafts," by F. J. R. Carrulla of Derby; "The Manufacture and Application of Water Gas," by Carl Dellwik of Stockholm; "The Equalization of the Temperature of Hot Blast," by Lawrence Giers and Joseph H. Harrison of Middlesbrough; "Blowing Engines Driven by Crude Blast Furnace Gas," by Adolphe Greiner of Seraing, Belgium; "The Solution Theory of Iron," by Baron H. von Jüptner of Donawitz, Austria; "The Use of Fluid Metal in the Open Hearth Furnace," by James Riley of Stockton-on-Tees; "The Manganese Ores of

Brazil," by H. Kilburn Scott of Minas, Brazil; "The Utilization of Blast Furnace Slag," by Ritter Cecil von Schwarz of Liège; "Iron and Phosphorus," by J. E. Stead of Middlesbrough; "The Continuous Working of the Open Hearth Furnace," by Benjamin Talbot of Pencoyd, Pa.

Among the Americans who will be voted on for admission as members at this meeting are Albert Ladd Colby of South Bethlehem, Pa.; Edmund E. Johnston of Ashland, Wis.; John Stuart Kennedy of Stanhope, N. J.; Simon S. Martin of Sparrow's Point, Md.; P. C. Patterson of the National Tube Company, McKeesport, Pa., and H. F. J. Porter of South Bethlehem, Pa.

The Bliss Straight Sided Wiring Press.

In the accompanying illustration we present a new type of wiring press, specially designed to obviate the necessarily slow and laborious handling of large and



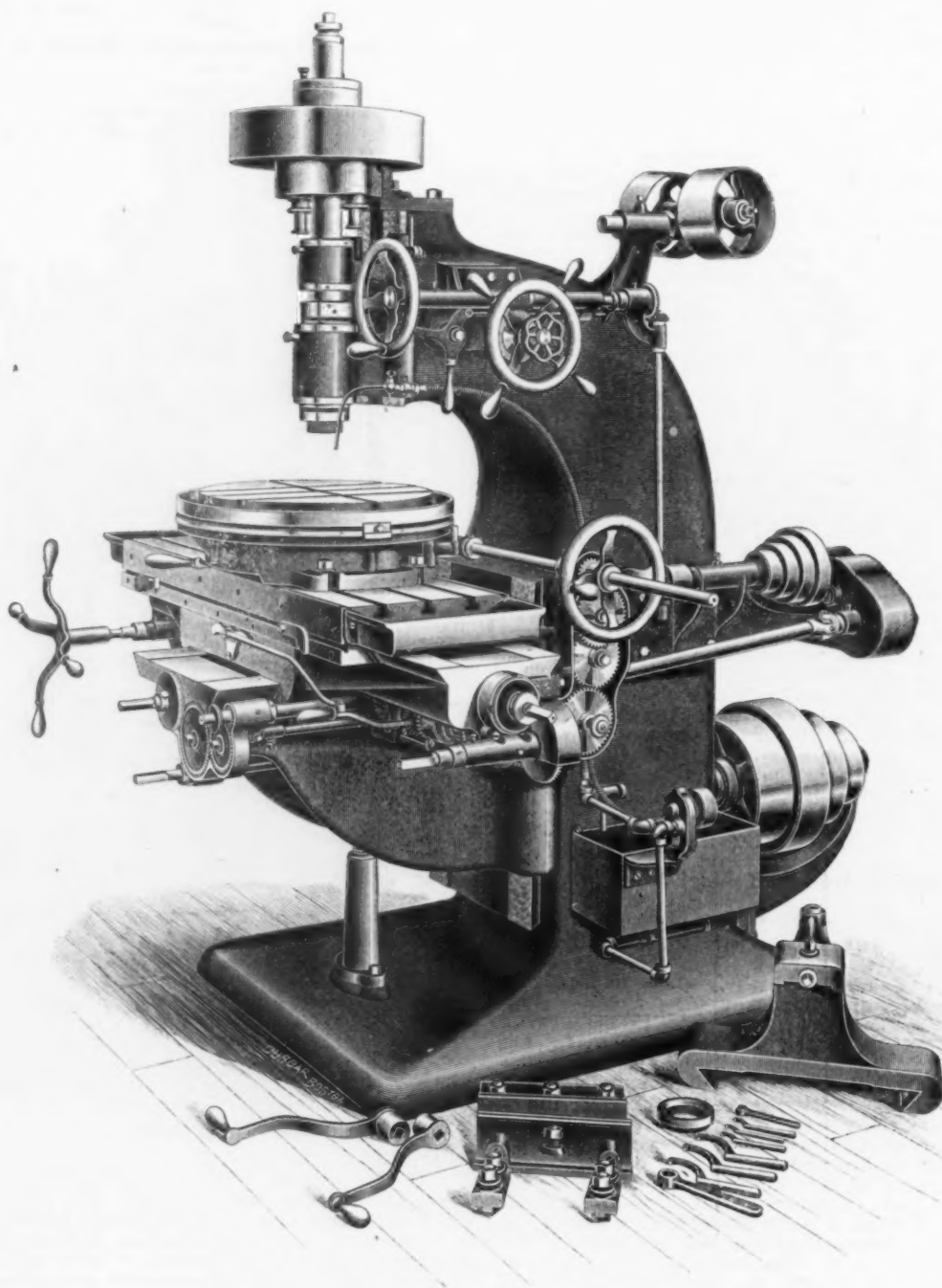
THE BLISS STRAIGHT SIDED WIRING PRESS.

heavy dies by the usual method. The stroke of the slide in this type of press is sufficient to raise the punch high enough to permit the insertion of the article to be wired in the die, or its removal, without the necessity of moving a heavy die with its slide forward and back, thus saving time and labor and also increasing the output considerably. The press is provided with an automatic friction clutch, and the slide is counterweighted. It is intended to build this press in three sizes, to wire up to, diameter and depth, 9 x 9 inches, 15 x 11 inches and 20 x 11 inches. The approximate weights of the presses will be 1550, 2250 and 4500 pounds. Some of the more important dimensions of the largest machine, irrespective of those given above, are: Distance, bed to slide, with stroke down and adjustment up, 14 inches; distance between gibs, 24½ inches; area of die bed, front and back, by right and left, 24 x 24 inches; stroke of slide, 18 inches; adjustment of slide, 14 inches; weight of balance wheel, 350 pounds; speed of balance wheel, 250 revolutions per minute; proportion of gearing, 1 to 10; height over all, with stroke up, 103 inches; floor space over all, front and back, by right and left, 50 x 70 inches. This press has been completed quite recently by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y.

The Becker-Brainard Vertical Spindle Milling Machine.

A noteworthy feature of the design of the vertical spindle milling machine No. 5 B, built by the Becker-Brainard Milling Machine Company of Hyde Park, Mass., is the convenience of operation, owing to the accessibility of all the mechanism. Further, the work in

spindle. The spindle driving pulley, mounted upon an adjustable auxiliary bearing, is back geared five to one; the spindle pulley is 16 inches diameter, 4 inches face. To balance the action the back gears are made in duplicate. The head has an automatic or hand movement of 9 inches, and an automatic stop dog which will throw out the feed at any point within the limit of its vertical movement, thus making this machine an excellent vertical boring machine. A micrometer stop gauge located



THE BECKER-BRAINARD VERTICAL SPINDLE MILLING MACHINE.

progress is always open to close inspection. The work is held rigidly close down to the platen rather than supported above it. The machine is of medium size, meeting the requirements of the average shop, and is an efficient substitute for lathe and planer, particularly in recess and similar work where two or more changes of a tool would be required in their other machines.

The spindle has long bronze bearings, made adjustable for wear, bored to B. & S. taper No. 11, and having a diameter at the main bearing of 3 inches. The mills are secured rigidly by means of a draw bar. The large surface mills are fitted to the threaded nose of the

at the upper left hand side of the frame accurately gauges the depth of the cut. The platen is 51½ inches in length over all and 14 inches wide, with 42 inches automatic feed in either direction; there is quick return motion, geared three to one; oil channels conduct the oil to removable oil pockets. The saddle is the same length as the platen, with automatic feed in and out of 16 inches. Both screws are dialed. The knee has automatic vertical feed; the extreme distance between spindle and platen is 21½ inches; between spindle and rotary table 16 inches. The rotary attachment has a graduated table 22 inches in diameter, which is fed auto-

matically in either direction. Adjustable dogs are attached to the periphery of the table to automatically trip the feed. The table feeds are derived from compounded gears giving eight changes for each change of spindle speed. The intermediate gears on the rotary feed bracket are interchangeable, increasing the speed six to one, thus providing 16 changes of feeds for the rotary attachment. The arbor support is attachable to the knee, and is used only when side milling with long and slim cutters necessitates such support. The vise jaws are 9 inches long, $2\frac{1}{2}$ inches deep, working in connection with the T-slots of the table. The countershaft has double friction pulleys 12 and 18 inches diameter, respectively,

motor to drive the blower. The generator will be driven by an engine of 125 horse-power, built by the Buckeye Engine Company of Salem, Ohio. The Bass Foundry & Machine Works of Fort Wayne, Ind., will furnish the boiler, which will be of 150 horse-power capacity. The new foundry building will be attached to the old foundry, which measures 60 x 160 feet, giving this concern one of the largest foundries in Western Pennsylvania. The company have additional ground, which will be used for future extensions.

At the present time the Pennsylvania Engineering Works have a large number of orders on their books, and are running their shops to full capacity. Included in these orders may be mentioned a 250-ton mixer and hydraulic hoist for the Shenango Works of the National Steel Company, at New Castle, Pa.; gas washers, and 20 pig metal

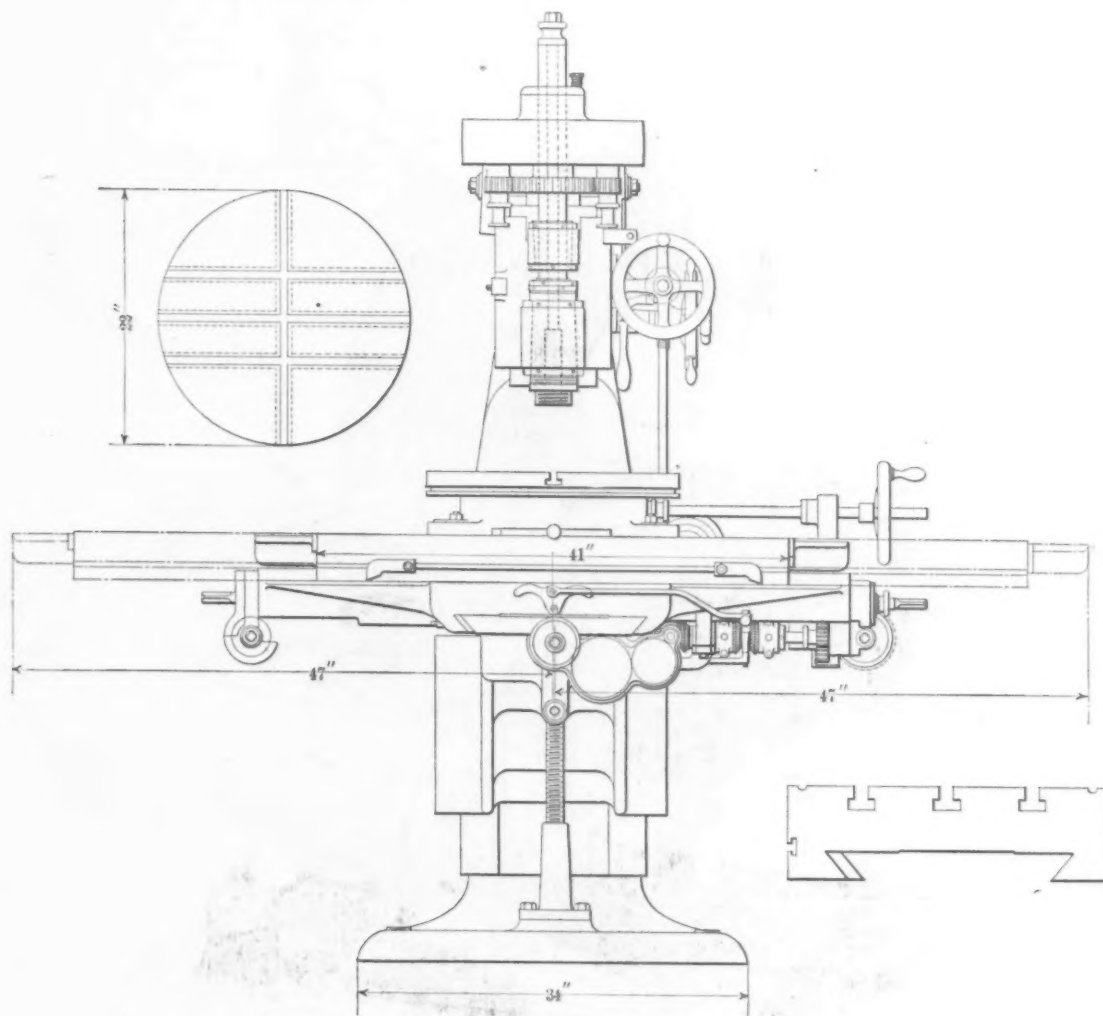


Fig. 2.—Front Elevation.

THE BECKER-BRAINARD VERTICAL SPINDLE MILLING MACHINE

$4\frac{1}{2}$ -inch faces. The speed of the large pulley is 400 revolutions and of the small pulley 100 revolutions.

Pennsylvania Engineering Works.

Through the courtesy of officers of the Pennsylvania Engineering Works, a representative of *The Iron Age* was recently shown through the extensive plant of that concern, located at New Castle, Pa. The works consist of foundry, pattern shop, machine department, forge shop and plate shop. At the present time some large additions are being made to the plant, included in which is a new foundry, 180 feet wide by 64 feet 3 inches between the runways of the crane. The building will be of steel frame construction, with corrugated siding and slate roof and will rest on stone foundations. It will be served by two electric traveling cranes of 15 tons capacity each, furnished by Pawling & Harnischfeger of Milwaukee, Wis. Power will be supplied by a 75 kv. generator, made by the General Electric Company of Schenectady, N. Y. The same generator will furnish power to the

cars for the Cambria Steel Company, Johnstown, Pa.; 12 coal larries for the United Coke & Gas Company, an identified interest of the Dominion Iron & Steel Company, Limited, Sydney, Cape Breton; 15 50-ton ladles for the new open hearth plant of the Carnegie Steel Company, at Duquesne, Pa.; cinder cars for the National Steel Company, hot blast and chimney valves and tuyere stocks for Frank C. Roberts & Co. of Philadelphia, to be used at the Warwick and Wharton furnaces; several large pulleys for the American Steel & Wire Company; large number of cast iron cooling plates for the National Steel Company, also a large number of bells and hoppers for Frank C. Roberts & Co., the National Steel Company, the Republic Iron & Steel Company and other large interests, and some large pillow blocks for the new open hearth plant of the Sharon Steel Company, at Sharon, Pa.

The product of the Pennsylvania Engineering Works consists of blast furnace and steel plant construction, general machine and plate work, while they also build pig, hot metal and slag cars, charging buggies, large ladles for open hearth and Bessemer plants and hydraulic machinery of all kinds. The company also have

special facilities for building heavy shell work, and have turned out some very large contracts for this kind of work. The Pennsylvania Engineering Works are op-

officers are as follows: George Greer, president; Edward King, treasurer, and John M. Watson, superintendent.

The lake shipping season has opened with prospects for an excellent business. There are said to be 141 vessels now afloat on Lake Superior, owned and used by the

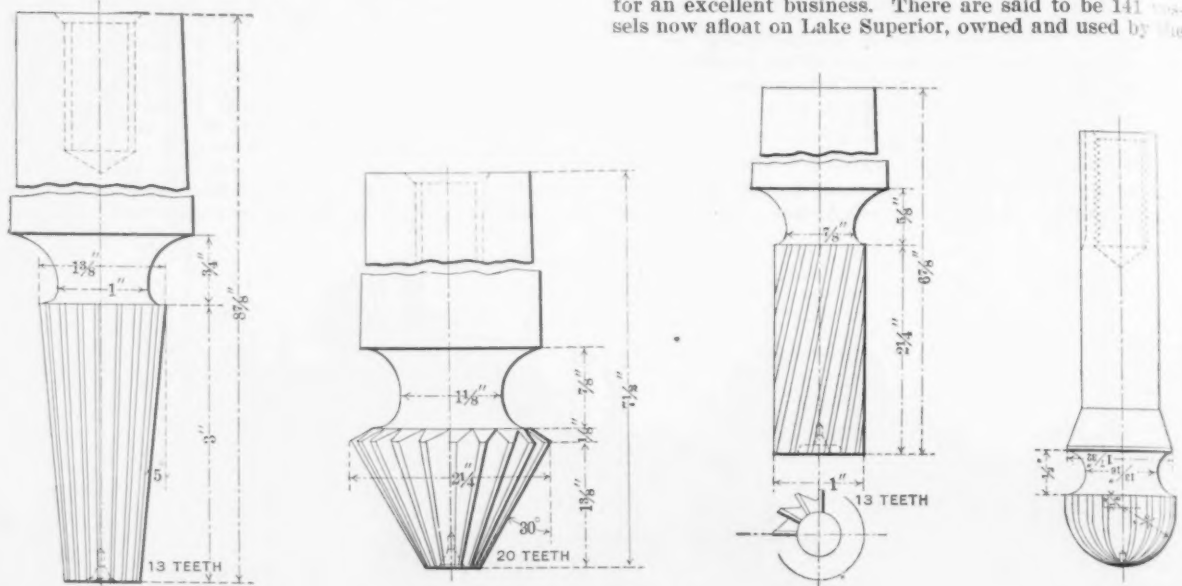


Fig. 4.—Specimens of Cutters.

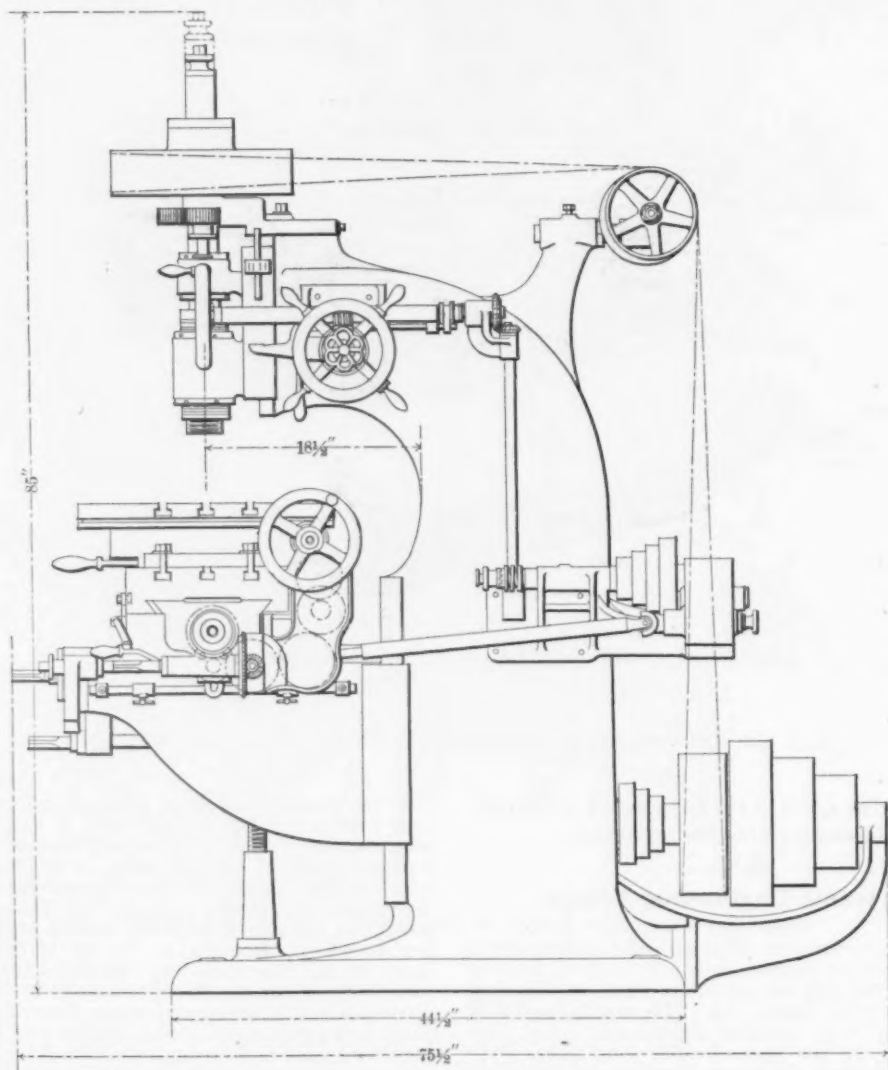


Fig. 3.—Side Elevation.

THE BECKER-BRAINARD VERTICAL SPINDLE MILLING MACHINE.

erating the plant originally owned by James P. Witherow and later by the New Castle Engineering Works. They have made a number of improvements to the plant prior to starting work on the new foundry noted above. The

various mining and manufacturing companies, which will be used in conveying ore from the upper lake ports during the year. It is expected that shipments this season will break all records.

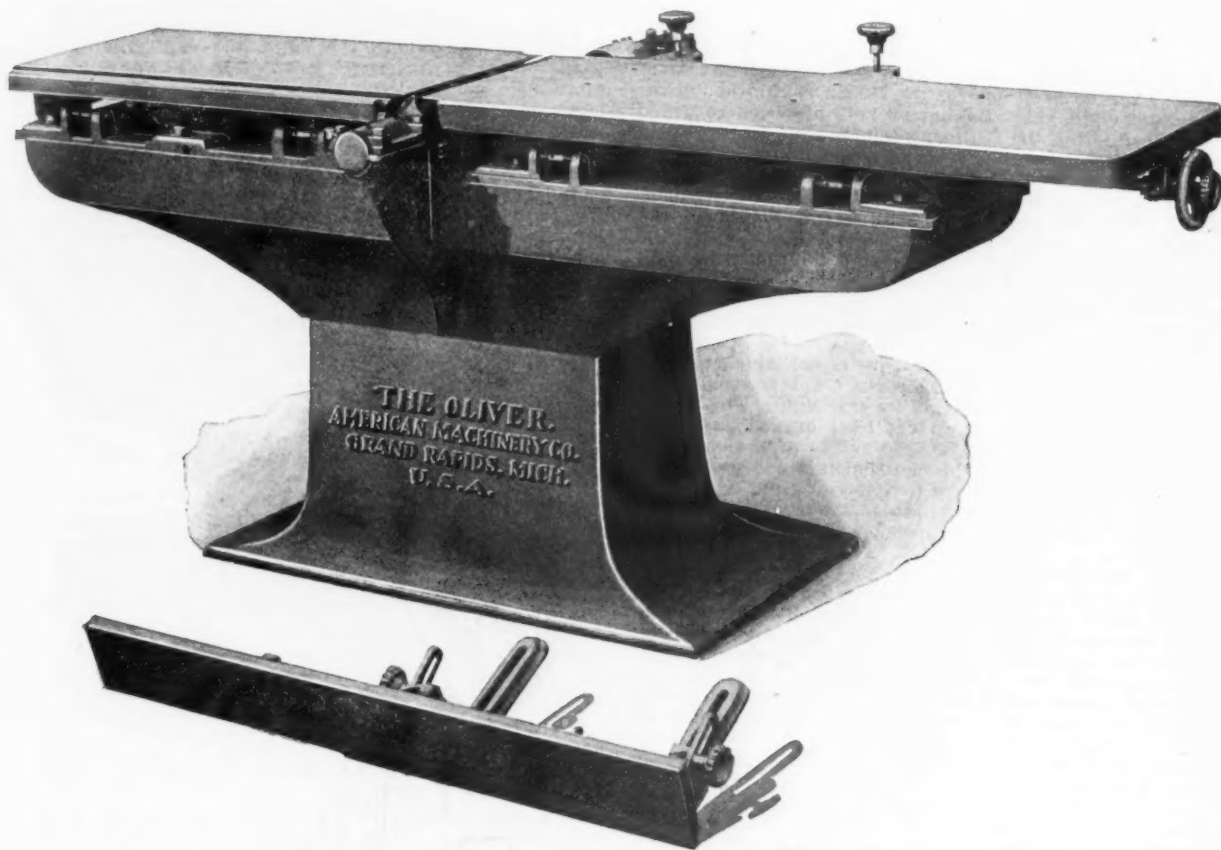
The Oliver 20-Inch Hand Jointer.

In the design of their new hand planer or jointer the American Machinery Company of Grand Rapids, Mich., have endeavored to provide ease of adjustment for different classes of work, convenient access to the knives for sharpening, ability to true up the table, secure a locking device for holding the table in any position where it may be adjusted, and a bed upon which wide, smooth boards will move easily. The frame is so designed that while ample support is given by the base, the operator is enabled to stand close to his work. The front table is 48 inches and the rear table 36 inches long. Either or both tables can be withdrawn from the knives or head to allow sharpening or adjusting the knives. If the tables ever become out of true, it is a simple operation to level them up, each corner having separate adjustable bearings. It is easy to regulate the depth of cut by dropping the front table. This is done by turning the small hand wheel shown in the cut at the end of the table. There is no danger of the table dropping while in use, as the wheels lock themselves so as to make this impossible.

The New Eight-Hour Bill Favored.

WASHINGTON, D. C., April 26, 1900.—The House Committee on Labor at a special meeting to-day directed a favorable report on the Gardner Eight-Hour bill, which has attracted much attention in labor circles and among contractors for Government work. In its amended form the bill is as follows:

"That each and every contract hereafter made to which the United States, any Territory, or the District of Columbia is a party, and every such contract made for or on behalf of the United States, or any Territory, or said District of Columbia, which may require or involve the employment of laborers or mechanics, shall contain a provision that no laborer or mechanic doing any part of the work contemplated by the contract in the employ of the contractor, or any subcontractor, contracting for any part of said work, shall be required or permitted to work more than eight hours in any one calendar day; and each and every such contract shall stipulate a penalty for each violation of the provisions directed by this



THE OLIVER 20-INCH HAND JOINTER.

The back end of the rear table can be dropped as much as desired to make a spring or glue joint, and as quickly brought back to a level without getting the tables out of place. A fluted surface on both tables, while preserving with care the accuracy of work, avoids the otherwise annoying suction on wide, smooth boards, and allows free, rapid action. A rabbeting groove is planed in the rear table. The head is made of forged steel and carries two cutters ordinarily, although it may be made to carry knives on four sides. There are three bearings, the two next the frame on each side being stationary, while the third or outboard bearing at the back is adjustable. The advantage in this is that the bearing next the table at the rear, which is the center one, is always bound to wear fastest, and by having the third adjustable it is not necessary to rebabbit as often. The oil cups are so constructed that the oil is fed from below through a piece of felt. No dirt can pass through the felt and it always holds a certain amount of oil, so that the bearings never run dry suddenly. The adjustable guide, shown in the cut below the machine and separate from it, can be set at 90 degrees or at any angle between that and 45 degrees or miter. An accurate stop makes it unnecessary to use a square in setting it at either 45 or 90 degrees. The guide can be moved back and forth so as to use the full width of the knives.

act of \$5 for each laborer or mechanic, for each and every calendar day in which he shall labor more than eight hours; and any other officer or person designated as inspector of the work to be performed under any such contract, or to aid in enforcing the fulfillment thereof, shall, upon observation or investigation, report to the proper officer of the United States for any Territory or the District of Columbia, all violations of the provision in this act directed to be made in each and every such contract, and the amount of the penalties stipulated in any such contract shall be withheld by the officer or person whose duty it shall be to pay the moneys due under such contract, whether the violation of the provisions of such contract is by the contractor, his agents, or employees, or any subcontractor, his agents, or employees. No person on behalf of the United States, or any Territory, or the District of Columbia, shall rebate or remit any penalty imposed under any provision or stipulation herein provided for, unless upon a finding which he shall make up and certify that such penalty was imposed by reason of an error in fact.

"Nothing in this act shall apply to contracts for transportation by land or water, or so much of any contract as is to be performed by way of transportation, or for such materials as may usually be bought in open market, whether made to conform to particular specifica-

tions or not. The proper officer, on behalf of the United States, any Territory, or the District of Columbia, may waive the provisions and stipulations in this act provided for as to contracts for military or naval works, or supplies during time of war, or a time when war is imminent. No penalty shall be exacted for violations of such provisions due to extraordinary emergency caused by fire, flood, or danger to life or property.

"Nothing in this act shall be construed to repeal or modify Chapter 352 of the laws of the Fifty-second Congress, approved Aug. 1, 1892, or as an attempt to abridge the pardoning power of the Executive."

Relative to this bill we have the following from our Washington correspondent:

WASHINGTON, D. C., May 2, 1900.—The House Committee on Labor, as foreshadowed in *The Iron Age* last week, has ordered a favorable report upon the pending Eight-Hour bill. Owing to circumstances that may appear somewhat peculiar the vote to report the bill was unanimous, there being present at the meeting but a bare quorum—seven members—of the committee. Of the six absentees it is believed that all with perhaps a single exception would have voted against the measure.

The bill as reported to the House has been very materially modified from the draft which has been pending in Congress for the past three years. The first and third sections of the bill, which were designed by the committee to re-enact the provisions of the Eight-Hour law of 1892, were stricken out for the reason that although for the past eight years the act of 1892 has been regarded as a dead letter, the California courts have just returned a conviction for the violation of its provisions, and have decided it to be of full force and effect. This law applied, however, only to public works constructed upon land owned by the Government, and section 2 of the pending bill being designed to extend the operation of the law to every class of Government contracts, the committee has adopted it as the chief section of the bill.

If the discussion which has already taken place publicly in the Committee of Labor had not fully developed the chimerical notions of the gentlemen who have drafted and favorably reported this remarkable measure, the report as drawn by Chairman Gardner would certainly present the measure in its true light. The manufacturers of iron and steel who have argued in opposition to the bill have emphasized as one of the chief objections to the measure the fact that it would greatly increase the capital necessary to a given output as well as the cost of every article produced. Mr. Gardner seizes upon this fact as a strong argument in favor of the bill and says:

"If, according to modern writers, capital represents the means of production, or if 'there are two sets of forces which can be employed in production, human force and natural force, and the latter represents the capital of the employer,' it follows, under the doctrines of all the writers, that whatever tends to increase the capital employed in production increases the demand for laborers. And even if it were true that the shortening of the work day resulted in no increased consumption and no increased output per hour, it would require greater natural forces, more means of production (i. e., capital) to produce the supply for a given demand. Hence the shorter day would necessitate the use of a greater amount of the means of production (capital) and would furnish additional employment to labor—i. e., employment to more laborers. And if it be true, as contended by modern writers, that the shorter day results in increased wants, better mode of living, and hence greater consumption among the laborers, hence an increased market, and hence greater production, there is called into productive activity the same amount of additional capital, employing the same number of additional laborers, by whatever theory measured.

"The proposition that without variation the elimination of intemperance, poverty, pauperism, ignorance, crime, and their accompanying evils move parallel with and proportionate to the increase of the social opportunities of the laboring class stands without impeachment of its historical accuracy. No recognized authority to-day combats the proposition that the condition of the laborer has improved with every reduction in the hours of daily service that has up to this time been made. Nobody is disputing that he has become a better consumer with each reduction. No reasonable person would for a moment entertain the proposition that the work day should again be lengthened to 14 or 12 hours. When the hours of work were so long that workers had no social opportunities they resorted to stimulants for solace and the saloon for society, where they encountered an 'iron law' for spending which could not be disregarded without loss of caste in the only society which they had opportunity to enter.

"A gentleman of responsibility and exceptional opportunity for observation has borne testimony that the shortening of the work day has banished 'blue Monday.'

"Economists who advocate the eight-hour day contend with great plausibility that the shorter day results in an increase of wages without an increase of price, as greater consumption enlarges production, and the larger the scale of production the cheaper the given article is produced; that the laborer, when he has the leisure resulting from the shorter hours, has new aspirations, ambitions, and greater personal self respect, and, as before stated, wants a better house, better furniture, better clothes, better food, and becomes a great deal better consumer; that the scale of wages is controlled by the wants of the laborer in any given state of society rather than by the 'iron law of wages;' that modern men cease to work under normal conditions if the proceeds of their labor do not satisfy their wants; that therefore the social status of the laborer controls the law of wages, rather than the law of wages the status of the laborer.

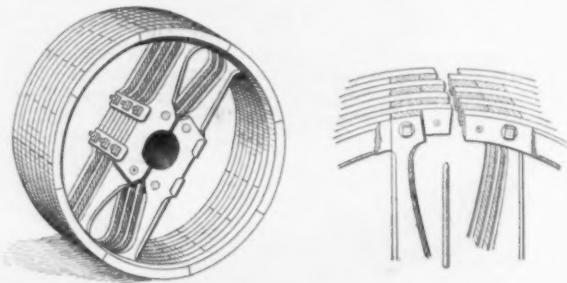
"The bill seeks to provide for the enforcement of the eight-hour laws by the simple system of a provision in the contracts, rather than to drive the laborer to the courts. By this method all questions of personal and natural rights are avoided. The contractor finds his rights expressed in the instrument which he executes. We submit that this introduces no new feature into Government contracts. Indeed, in every instance, before payment is made on any contract, it is the business of the officials to ascertain if it has been complied with, and if the money is due, and if not due because of non-compliance, to withhold it. Nobody denies the right of the Government to make and enforce such a contract."

Chairman Gardner now expects to call the bill up in the House within a week or ten days, and expresses great confidence that it will be passed by a large majority. His confidence is probably well based, as the bill went through the House a year ago without debate. As heretofore stated, the opponents of the measure hope to secure its defeat in the Senate.

W. L. C.

The Gurney Wood Pulley.

In the wood pulley made by the Gurney Mfg. Company of Roan Mountain, Tenn., the construction of the cross bars and hub is such as to secure strength where it is



THE GURNEY WOOD PULLEY.

most needed—namely, in the direction of the pull of the belt. The hub is solid and is made of mountain rock maple. The balancing of the pulley is obtained by the use of material of uniform weight, and by reason of the exact inside and outside diameters. The method of fastening the arms into the rim, shown in the sectional drawing, takes everything from the strength of the rim at this point. The arms are nailed and glued in as the pulley is built up, and then, in the larger sizes, a bolt is put through the rim at this point. The meeting ends of the rim interlock, and are secured by a pin through the overlapping parts.

The National Tube Company.

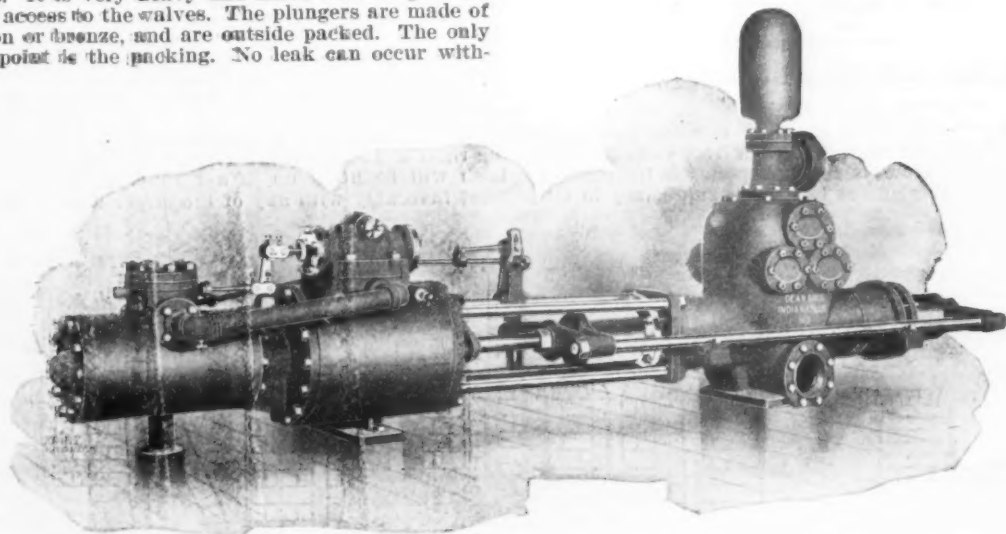
The report that A. S. Matheson had resigned his position as general manager of the National Tube Company is untrue. Mr. Matheson has discontinued his duties in connection with the manufacturing department to assume charge of the foreign sales department, with headquarters in New York City, still retaining the title of general manager. W. B. Schiller, manager of the National department of the National Tube Company, discontinues his duties in that position, and goes to Pittsburgh as assistant first vice-president. At a meeting of the Board of Directors of the company, held in New York on April 20, Mr. Schiller was elected to fill the vacancy on the board caused by the death of Horace Crosby. No arrangements have been made to fill the position of second vice-president, which was held by Mr. Crosby, nor have arrangements been completed for filling the position of manager of the National department, formerly held by Mr. Schiller.

Dean Bros. Steam Pumps of New Patterns.

The double plunger pump here shown is of the single type intended for pumping against heavy pressure. The pump cylinder is a single casting designed to sustain high pressures. It is very heavy and made with large hand holes for access to the valves. The plungers are made of either iron or bronze, and are outside packed. The only wearing point is the packing. No leak can occur with-

Chester Notes.

CHESTER, Pa., April 26, 1900.—The Seaboard Steel Casting Company, an outline of which was given a few weeks ago, have awarded to the McClintic, Marshall



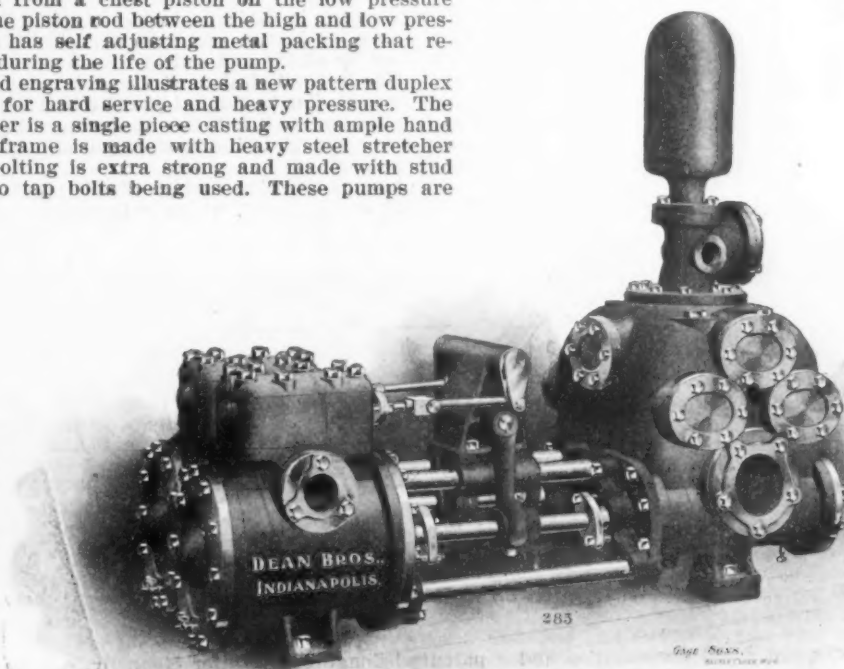
DEAN BROS. DOUBLE PLUNGER PUMP WITH COMPOUND STEAM CYLINDERS.

out its being observed, and it is easily stopped by screwing up the packing. The piston rods do not enter the pump cylinder, and therefore are not exposed to the action of the water. This pump is especially designed for feeding large batteries of boilers and for pumping water containing sand or dirt. The steam cylinders are tandem compound. The valves of both cylinders are operated from a chest piston on the low pressure cylinder. The piston rod between the high and low pressure pistons has self adjusting metal packing that remains tight during the life of the pump.

The second engraving illustrates a new pattern duplex pump made for hard service and heavy pressure. The water cylinder is a single piece casting with ample hand holes. The frame is made with heavy steel stretcher rods. The bolting is extra strong and made with stud and nuts, no tap bolts being used. These pumps are

Construction Company of Pottstown, formerly the Pottstown Bridge & Iron Company, the contract for the erection of the steel building on their property on the Delaware River front, between Jeffrey and Townsend streets, this city.

The main foundry building will be 500 feet in length, 110 feet in width, and will be steel framed, with brick



DEAN BROS. DUPLEX STEAM PUMP.

built by Dean Bros. Steam Pump Works, Indianapolis, Ind.

The London *Chronicle* is authority for the statement that a scheme is on foot in England for the establishment of new works for the production of armor plate and naval ordnance on a vast scale. Ninety acres of land have just been acquired on the banks of the River Tees, on which it is proposed to establish the largest works in the world. The promoters, it adds, are sending a commission to the United States to examine American methods of manufacture. It is expected that this commission will report at the end of June.

curtain walls. The machine shop is 80 x 300 feet, with an annex for a power house in which will be installed the boilers, engines and electrical machinery. The contract for these structures was competed for by prominent firms all over the country.

Roach's shipyard is the scene of much activity. Materials are arriving at the yard with a little more regularity than they have been during the past winter. The launch of No. 308, the first of the three largest freight steamers in this country, will be about the last of June. It will be a great event in the history of the shipyard. Extensions are being made to the compressed air machinery of the yard. This is one of the special features

of the plant, and the employees do not denounce it as they did when first introduced.

Never in the history of Old Chester has there been such activity among the employees in the iron and steel works in organizing trade unions, composed of puddlers, molders, forgemens, &c. The query is asked, is this a forerunner of good or bad times?

The New Columbus Blast Furnaces.

The men who are doing the most to bring this country to the front in the manufacture of iron, so as to cause the leading engineers of our neighbors across the pond to ask seriously if England is losing her supremacy in the

Walter Kennedy, engineer, Pittsburgh, Pa., in such a way that they will be making pig iron in six months after the plant was started. We are indebted to Mr. Kennedy for the illustrations and description of the plant. The ground is almost level, and of such a character that it will be necessary only to go below the frost line to get a good foundation, and in addition to this great advantage a good water supply can be obtained by drilling wells to a depth of about 40 feet below the surface. The general design of the plant is shown in the accompanying engravings, a brief description of which follows:

The two furnaces are exact duplicates, except for being right and left, and are 17 x 75 feet. Each hearth and bosh will be fitted up in a manner that will compare most favorably with any of the larger modern furnaces.

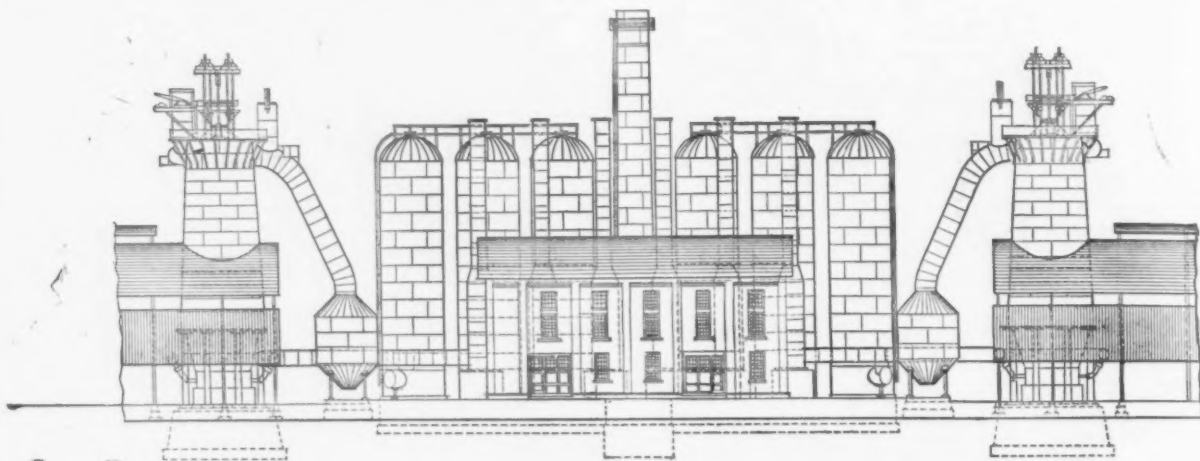


Fig. 1.—Side View.

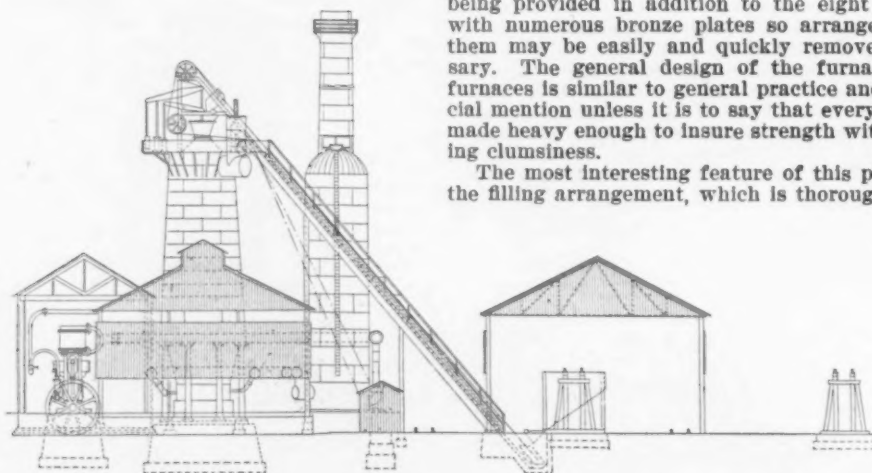


Fig. 2.—End View.

THE NEW COLUMBUS BLAST FURNACES.

iron business, are men who can grasp the situation and act promptly, and who have that rarest of all talents which enables them to choose good locations geographically for the assembling of raw material and the distribution of finished output, and to select the best appliances for the economical handling of the material at the works. Col. A. H. Marting of the Marting Iron & Steel Company of Ironton, Ohio, and F. H. Miller of the firm of Miller, Wagner & Fleser are pre-eminently men of this type. Colonel Marting is president and Mr. Miller vice-president and general manager of the Columbus Iron & Steel Company. After looking over the field carefully they decided to locate at Columbus, Ohio. They have selected the very best modern equipment that has been thoroughly tested in a practical way, avoiding any complicated arrangements which are so liable to prove disappointing in actual working, and which require in many instances more expense in employing machinists and mechanics to keep the apparatus in repair than will be saved in reducing the amount of labor required in handling the raw material. With their usual energy they have placed all their contracts, with the assistance of

being provided in addition to the eight tuyere coolers with numerous bronze plates so arranged that any of them may be easily and quickly removed when necessary. The general design of the furnace part of the furnaces is similar to general practice and needs no special mention unless it is to say that everything has been made heavy enough to insure strength without approaching clumsiness.

The most interesting feature of this plant is perhaps the filling arrangement, which is thoroughly covered by

patents belonging to Walter Kennedy, and has been in successful operation for several years, so that it is past the experimental stage. The extreme simplicity of this apparatus will be noted at a glance. It does not require any high priced mechanics in adjustment, nor the use of any top fillers, in this way effecting a very great saving in labor. It removes the annoyance caused by strikes of the top fillers, and prevents the danger of loss of life in case of an explosion, which might wreck the top of the furnace. It also effects a very great saving in the fuel which is ordinarily wasted at the top of the furnace when the big bell is open, as it forms a perfectly working gas seal. The bell, hopper and the parts of the furnace above the charging platform have much greater durability with this arrangement, as they are not subjected to the heating and cooling and incidental expansion and contraction which ordinarily occurs when the bell is open, allowing the gases to flame out at the top. The distribution of stock with this arrangement is absolutely perfect, and cannot possibly be affected by dissatisfied workmen. This feature in itself removes a frequent cause of anxiety on the part of the furnace super-

intendent, particularly if his furnace should be working badly during a time of labor trouble.

The hopper is of the usual design, but resting on this is the gas seal hood, the top of which forms a seat for the distributing arrangement known as the "clam shell" or "chestnut burr." This consists of a small hopper like ring with a cylindrical opening and lugs to which are hinged the clam shell. The latter consists of four wings which when closed form a cone with the apex down, and fitting around the bell rod so as to prevent the escape of gas when the large bell is lowered. The clam shell is operated by means of a beam similar to that for the large bell, to which each wing of the former is attached by means of a chain. Both the large bell and the clam shell are worked by means of cylinders actuated by either steam or compressed air, which are controlled by the same man who operates the skips, charges the coke, and superintends the charging of the other materials. This man stands at a convenient point near the bottom of the incline and from this point controls all the filling arrangement of the furnace. From this it will be seen that no one is required on top of the furnace; consequently the expense of operating is greatly reduced, as, in addition to doing away with top fillers, there is no handling of the coke necessary, this being emptied di-

rectly from the cars into the bins and then into the skips by gravity. The various accessories to the plant will be of a kind and character similar to general practice, and therefore require no particular mention. There will be six 18 x 75 foot Foote stoves, three for each furnace, and the plans are so made as to permit of the addition of a fourth one to each furnace if it is ever considered necessary. The blowing capacity will be very liberal for furnaces of this size, there being five engines with 54 x 84 inch air cylinders, so arranged that any one of them may be disconnected from the receiver and still have two engines on each furnace, and also when one furnace is out of blast, any or all of the engines may be put on the other furnace. The boiler plant will consist of six vertical water tube boilers of 350 nominal horsepower each, and here also provision has been made for additional boiler capacity when necessary. Each boiler will be fitted with an independent stack, but the six stoves will lead through underground flues into a common stack, which will be 8 feet diameter and 175 feet high. A common gas flue will pass between the stoves and boilers, and will be so arranged that the gases from both furnaces may be combined when both are in blast, or one furnace may be shut off entirely and yet any or all of the boilers can be in use.

Each furnace will have a cast house 60 feet wide and

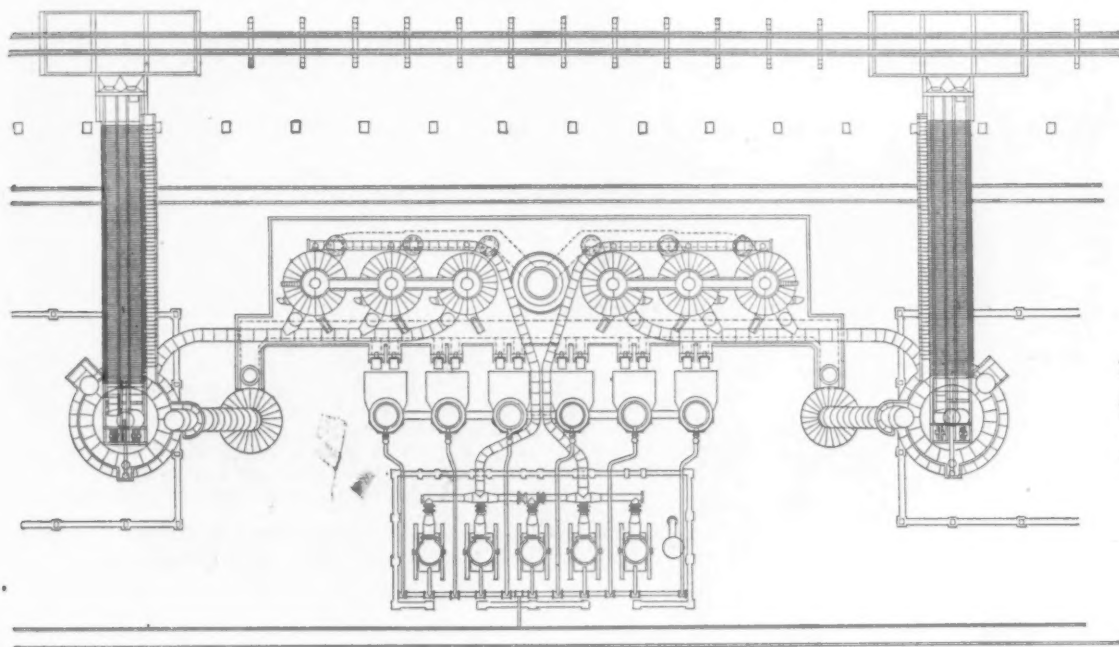


Fig. 3.—Plan.

THE NEW COLUMBUS BLAST FURNACES.

rectly from the cars into the bins and then into the skips by gravity.

It will be noticed that the ropes are carried over the top of the framing, down on the back or opposite side to the incline and across on each side of the hopper to a sheave under the incline and from this down to the engine, which stands under the incline on a solid foundation.

This arrangement permits of several very desirable features—viz., building the engine on a solid foundation instead of upon a high trestle; giving the skips a variable travel instead of bringing them up against a fixed guide, dumping lever or stop, and simplifies the top framing by making the pull of the ropes in line with the girders of the incline, thus transmitting the strain directly to the foundation.

A simple yet very useful adjunct to the top of these furnaces is a small jib crane on each so arranged that the bell may be placed on top of the furnace and any part of the top which requires removing may be swung into place with very little trouble, and the various details of the top are so made that they may be very easily removed for the purpose of changing a bell or any other portion when necessary. The loss of time which usually occurs on a blast furnace in keeping the bell and hopper in good working condition is very much diminished in this case from the fact that there are no top fillers to be annoyed by gas leaks; a change may be made from an old bell to a new one because the filling arrangement does not need to be interfered with until the bell is on top of the furnace; and the bell itself lasts longer because it is not alternately heated and cooled by

175 feet long. There will also be a common stock house 62 feet wide and 300 feet long, which, as well as the cast houses, will be built of steel.

The pumping plant will have a circulating system with a capacity of from 5,000,000 to 6,000,000 gallons, and a fresh water supply of 2,000,000 gallons. The fresh water, as mentioned before, will be pumped from deep wells directly into the stand pipe, which will be 18 feet diameter and 60 feet high. The waste water from the furnaces will flow into a large basin and be pumped from it into the stand pipe, and a novel system of cooling will be adopted. The overflow pipe will be taken out near the top of the stand pipe and be carried with a slight fall to a cooling tower, which will be built directly over the basin, and as the difference between the level of the stand pipe and the basin is about 10 feet, the available height of the cooling tower will be 60 feet. The water for the furnaces will be taken out of the stand pipe at a point level with the combination water pipes around the furnace boshes, which are about 8 feet above the bottom of the stand pipe.

This is merely a brief description of what is going to be a very complete plant, and one that will undoubtedly make itself known among the iron producers of its section. It is in the hands of men who have proved themselves masters of the art, and it will give a good account of itself when it meets with competition which allows only the survival of the fittest.

The annual New York State Commerce Convention will meet at Syracuse on June 6 and 7.

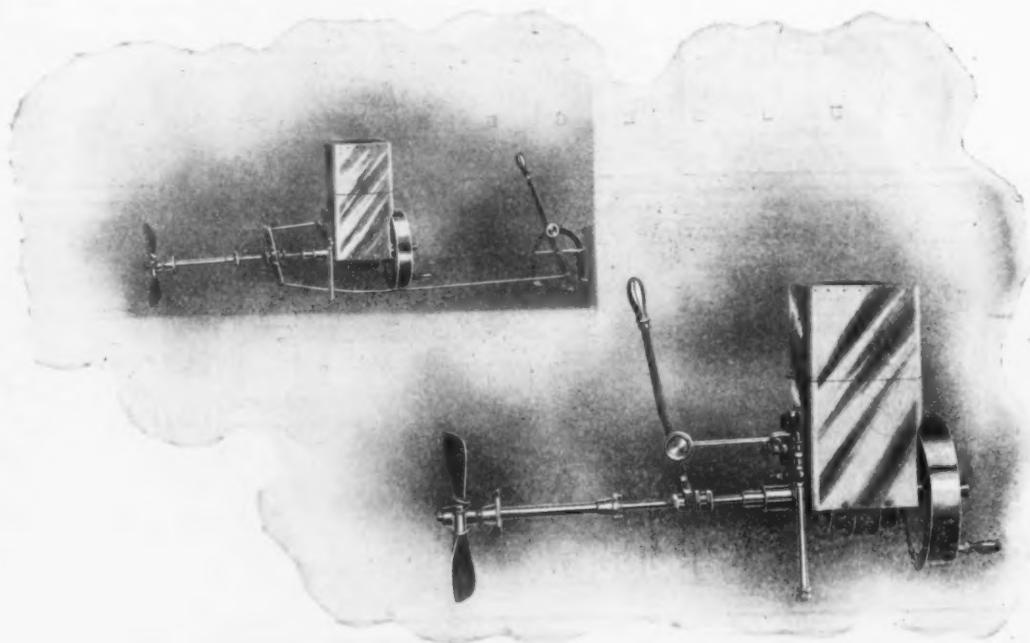
The Truscott Propeller Wheels and Motors.

The Truscott Boat Mfg. Company of St. Joseph, Mich., are the builders of the reversing propeller wheels and double cylinder motors here illustrated. Two of the methods employed for reversing the blades of the propeller wheel are shown. The lever can be placed either in the bow of the boat or toward the stern. The wheel is properly balanced, and can be moved in either direction with ease by the use of the lever. This is possible because the reversing power is conveyed to the blades from both sides of the hub, overcoming all tendency to bind or cause friction. When in action the blades are so constructed as to be scientifically correct, with a perfectly true screw, and when reversed will stop the boat within its length. They are made of bronze, exceptionally heavy to stand any blow, and can easily be removed, straightened and replaced if they should by any accident be bent. The propellers range in size from 14 to 26 inches.

The igniter in the four-cycle double-cylinder motor shown in the second engraving is extremely simple in design. The contacts have very large wearing surface, so constructed that the contact surface may be changed while the engine is running or at any other time, thereby doing away with the necessity of replacing the con-

over ready for operation, including engineering, was done by the Frank-Kneeland Machine Company, and the successful start reflects great credit on their skill as engineers and builders.

Ground was broken April 23, 1899, and the first eight mills were started April 6, 1900. The remaining eight mills were started in the presence of the executive board of the National Enameling & Stamping Company, on Tuesday of this week, May 1. The six mills in the old department have been in operation for some months. The main building is 120 x 640 feet, with a central 60-foot bay for traveling cranes and a lean-to on each side of 30 feet. In this building there are 16 sheet mills, 26 x 30 inches to 26 x 40 inches, with 27,000 pound housings and steel spindles 20 feet long, with most improved carriers. The auxiliaries include 16 38-inch knife electrically driven doubling shears, 16 squaring shears, 36-inch to 54-inch knives, driven from two line shafts, each being driven by a 20 horse-power motor; four 42-inch roll lathes, each driven by a separate motor, and two 20-ton capacity electric cranes which handle the rolls, bars and finished sheet piles. The engines and their connection to the mills are a special feature. There are two groups of eight mills, four on each side of the engines, which are two 30-inch and 56-inch by 60-inch tandem compound condensing, coupled at right angles to one shaft with a fly wheel 30



THE TRUSCOTT REVERSING PROPELLER WHEELS.

tacts. The mixture of gasoline gas and air is admitted directly into the top of the explosion chamber, and in such a manner as to insure the positive expulsion of all burnt gases from the cylinder. A thorough and positive lubrication of all parts of the motor is assured. These engines are made 10, 12 and 14 horse-power.

The National Enameling & Stamping Company's New Mills.

The consolidation in January, 1899, of the granite and stamping ware interests involved the advisability of providing their own supply of tin plate and stamping sheets, amounting to over 300 tons per day. With this in view, the National Enameling & Stamping Company acquired a 10-mill tin plate plant in St. Louis, which they have operated for some time in the manufacture of tin plate. They also own and have operated in Granite City, Ill., a very complete open hearth steel plant, and contracted with the Frank-Kneeland Machine Company of Pittsburgh, builders of rolls and rolling machinery of all kinds, for a sheet mill plant to be built in connection with the steel plant, and to contain 22 complete sheet mills. Of these mills six are installed in their former plate and bar mill buildings, together with electrically driven doubling shears, squaring shears and six pairs of improved gas furnaces of the company's special design. The remaining 16 mill addition is entirely new and possesses in arrangement and design what is claimed to be the most convenient and economical plant in the world. The entire contract from the barren ground to the turning

feet diameter and weighing 100 tons on the central portion of this shaft. The driving of the mills is through the Kennedy patent rigid return cranks attached to each wrist pin, which is of 22-inch diameter. The driving spindles enter a renewable socket in these cranks, avoiding the usual crabs and boxes, and places for back lash and trouble; also providing a space between the driving spindle and the end of the first roll for accidental shoving due to diagonal breaking of the rolls.

The furnaces are all for the use of producer gas on the recuperative plan, and heat the bars and sheets without scaling and with great fuel economy. The pickle house is a brick building 190 x 126 feet, containing four Mesta pickle machines. Adjoining this building is the brick annealing, cold roll and cutting house, 94 x 525 feet. Ten double recuperative gas furnaces, with Freeman patent charging machines, two 20-ton electric traveling cranes, 10 22 x 38 inch cold rolling mills, placed tandem in pairs, and driven by a 22 x 42 inch geared Corliss engine, cutting machines for preparing the blanks for shipment to the various works and a depressed shipping track constitute the equipment of this building. The boiler house, 45 x 251 feet, contains four 175 horse-power Cahal and eight 300 horse-power Heine boilers, all equipped with Playford stokers and automatic ash conveyor and elevator. Duplicate hot water pumps, heater, vacuum engine, air compressor and centrifugal pumps supply the Worthington syphon condenser and cooling tower for hot well water, which is reused. In addition there are one producer house, 40 x 60 feet, and one 40 x 100 feet, containing five and eight Duff gas producers, respectively. A complete system of narrow gauge tracks is operated by a 3-ton pneumatic locomotive. Bars for these mills are

manufactured of open hearth steel made in their five 30-ton steel furnaces. The buildings were erected by the Shilller Bridge Company, Pittsburgh, Pa.; the engines by the C. & G. Cooper Company, Mt. Vernon, Ohio, and the cranes by the Morgan Engineering Company, Alliance, Ohio, and all other machinery and construction by the Frank-Kneeland Machine Company, assisted by F. Felkel, engineer in charge.

Pacific Coast News.

SAN FRANCISCO, CAL., April 23, 1900.—The interest of the contest which was partially fought out at the Interstate Commerce inquiry in this city has not yet abated, and every step of its progress is being eagerly watched by the members of our mercantile community. They were represented by some of the leading members of the hardware and grocery trades, especially at Los Angeles and Portland, and whoever else may be derelict, if, indeed, there be any, California has done her share in this fight.

costs them twice as much or even more. It would for a while doubtless be a great inconvenience to the jobbers of this city to route their freight by water, but once they had the matter down to a fine point they would without doubt continue to stick to the water route, and there are many more facilities now than formerly for this as a 60-day trip; a trip round the Horn is not after all a very long one, and steamers carrying 10,000 tons of freight and more would be employed. The railroads, with their heavy expenses and increased cost of labor and fuel west of the Rocky Mountains, could not hope to successfully compete, and the attempt to do so would result in heavy losses to them—indeed, it was hinted at in the investigation here, to eventual bankruptcy.

The whole question of policy or constitutionality of the Interstate Commerce law may, through this fight, be brought up again. That law forbids discrimination as to persons, places, time, distance and what not, and if administered or rather if construed liberally would revolutionize the whole internal commerce of the United States. And however well meaning the supporters of the

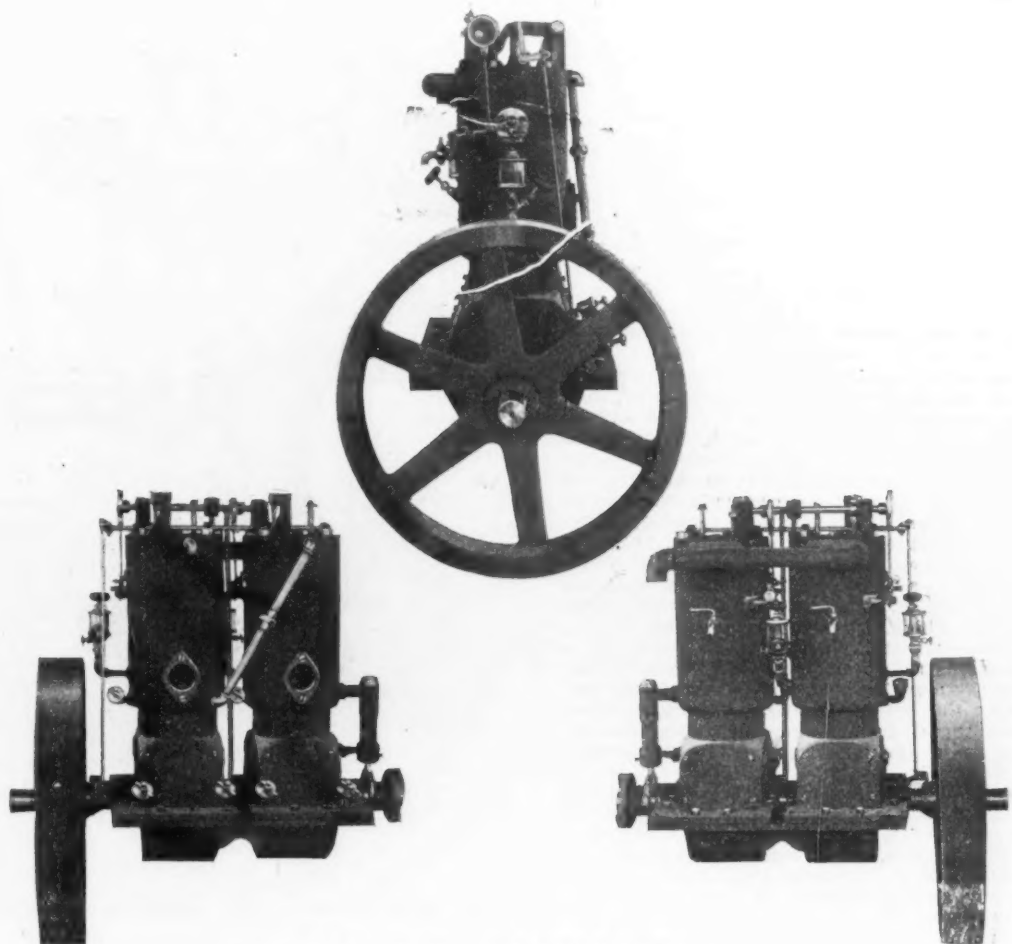


Fig. 2.—The Truscott Double Cylinder Motors.

There was some important evidence given at the session of the commissioners which was held at Portland, Ore., on the 10th inst. Here testimony was given that the jobbers of the Middle West had not given the retailers the advantages of the reduction in differentials that some of their friends claimed would follow. In California the claim has been constantly made that the increased differentials following the Milwaukee tariff acted prejudicially to the retailer and consumer, but though the differentials have been narrowed by both the Great Northern and the Northern Pacific no difference in the condition of these classes has been noticeable. The witnesses for the roads here mentioned gave evidence that the narrowing of difference made by them was due to coercion from Middle West jobbers, who threatened to change the routing of their goods from these roads if this was not done.

Arguments will be heard in Washington in June, and the Middle West may put in some evidence in rebuttal. Attorneys Pillsbury and Herrin will appear for the railroad company. It is as much the interest of the latter as it is of the mercantile community. Indeed, more so, as it resolves itself into a question as to whether the roads will be able to carry through freight at a living price or not, and as to whether they can be forced to carry less than carload lots at carload rates when it

enactment were they forgot to consider that it is cheaper to carry the same description of goods a long distance than a short one, cheaper to carry large quantities than small ones, and to attempt to tie down those places having the advantages of water competition to the same rule as those that do not possess that advantage is a self evident impossibility. In fact, the act is now on trial, and the far reaching interest of the outcome, whatever it may be, can hardly be overestimated. Whichever party is defeated will doubtless appeal to the courts, and the result of that appeal will be the groundwork of future legislation. Indeed the representatives of the railroads admitted that compliance by them with the strict construction of the act was an impossibility as long as they wished to carry on transportation at a profit, admitted it in such good set square phrase that there could be no mistaking.

Business is at present rather quiet, and partly for reasons that prevail in New York as well as in San Francisco, partly also because of the season. Arrivals via Canadian Pacific have been considerable. Arrivals by water, which usually run 22 to 25 per cent. of the total tonnage, have been inconsiderable during the past two weeks. Outside of the importations via Canadian Pacific, which reach here on the Sound steamers, we had only the arrivals on the "City of Para" and the "Irrawady." The "Doric" had 1616 ingots of Straits tin. The Australian

steamer none. We are obtaining supplies of tin plate to some extent by Canadian Pacific. The imports of pig tin for three months, from January 1, have been \$524, ingots, and of tin plate by sea, 40,389 boxes. There have been large imports of nails by sea since January 1. In one lot 20,000 kegs. Prices in almost all lines are firmly held, and as stocks now on hand have been mostly purchased at high figures they will have to remain so, although the Pacific Coast motto, as recently given by a prominent hardwareman, has been "Prompt to reduce, slow to advance."

Exports of hardware, iron and steel and machinery, pipe, &c., show no signs of decreasing, though apart from the in transit shipments to the Orient they are principally to the Hawaiian Islands. And as long as such results as those of two large plantations in the neighborhood of Honolulu on the island of Oahu can be realized—to wit, \$1,500,000 profit on the present crop—these exports will keep up. One of these plantations averaged over 13 tons of sugar to the acre, or nearly \$1000 an acre. This is through irrigation and the use of fertilizers, and for a long time to come irrigation and milling machinery will be at a premium. There have been large shipments of nails to the Orient. The "Doric" took out 4500 kegs, valued at \$31,400, to Japan, large quantities of fence wire, &c. The small vessels that trade between here and the islands have of late carried from \$20,000 to \$60,000 worth of machinery, pipe, &c., not to refer to much larger shipments of which I have already informed you. The "Rithet," that cleared on Saturday, had track material for a railroad, valued at \$28,925; steel ties, \$6500; railroad material generally, \$21,750; machinery, \$3500, &c. The "Dora Blum," clearing to-day, but not yet finished, has steel ties, &c., in large quantity. J. O. L.

The Maywood Stand Molding Machine.

The accompanying illustration shows one of a set of stand molding machines for making standard railroad knuckles. It is of the stripping plate type, as will be seen, and the operation of making molds is simply to place the flask on the machine, fill with sand, ram and then draw the pattern downward through the stripping plate by pulling the lever forward. This machine is built in all sizes, from 10-inch square or round up to 16-inch square or round, of the standard type. It has a buffer or compression spring seated in the movable sleeve which works on the supporting shaft, which is on the inside of the sleeve, where it cannot be reached by dirt or dust, and which, when the pattern and pattern plate are dropped with the movable frame, serves as a buffer and prevents the force of the downward motion and weight of the movable head and patterns from jarring or shaking the sand from the mold, which often occurs in other types of machines which have no such means of preventing the jar occasioned by the sudden stopping of this weight.

On the side of the machine to which is attached the hand lever and shaft for operating the machine is an adjustable bracket, with a set screw shown, extending through the lower plate of the machine, by means of which the pattern may be raised or lowered any desired amount by simply turning the set screw. This screw is cut with ten threads to the inch, so that any desired adjustment may be obtained. The four posts supporting the stripping plate also act as guides for the movable head and pattern plate attached thereto, and is fitted with bushings so that perfect alignment of the patterns is always maintained and all possibility of shifting of the pattern prevented, thereby securing perfect castings at all times. Another advantage of this means of guiding the movable head carrying the patterns is that where a long pattern is used on molding machines, as usually constructed, when ramming at one end there is a tendency to tip up and loosen the sand at the other end, as the guide is near the center of the pattern, but with this construction the guide is at the four corners of the machine and the bushings are so accurately fitted to the guide posts that no amount of ramming can tilt the pattern.

The operating shaft for raising and lowering the movable head and patterns is mounted in roller bearings, giving ease of operation with a minimum amount of wear. The stripping plate is fastened in place by four countersunk screws inserted into the ends of the four guide posts, and a change to a different set of patterns is easily and simply made by removing these screws and four screws in the corners of the pattern plate, to which the patterns are firmly fastened by means of dowel pins and screws, and the whole is then lifted off and another set of patterns and plate screwed in place, and the machine is ready for operation in less than five minutes. This change can be made by any laborer and no skilled mechanic or machinist is required.

The output of knuckles from this set of machines equipped with two patterns has been more than quadrupled, as compared with hand molding, and the castings are uniform and perfect, and no grinding or fitting is required as formerly, except merely to grind off the gates, and they are ready to drop in place with a perfect fit.

Where a greater output is desired large stationary machines, operated by a compressed air cylinder for raising and lowering the pattern plate, are used and the flasks are handled by air hoists, and with a set of these machines four men make from 400 to 500 knuckles per day. They are also built interchangeable, so that a draw bar, a lift pin and locking device can be made on another stripping plate, and by removing the knuckle plate and patterns draw bars, pins and lockers can be made on the same set of machines at the rate of from 100 to 125 per day of each with four men.

These large machines are built up to any required size, the manufacturers having now in process of construction machines for making castings 10 feet long, and



THE MAYWOOD STAND MOLDING MACHINE.

In fact, there is no limit to the size of castings that can be made on them, the only requirement from the standpoint of the buyer being that he has a sufficient number of castings of a given kind to make to justify the initial cost of a set of machines and patterns.

The manufacturers are the Maywood Foundry & Machine Company, 505-507 Monadnock Building, Chicago.

The aggregate capitalization of new American corporations with \$1,000,000 or more of authorized capital chartered in the month of April amounted to over \$325,000,000. Of this sum \$100,000,000 is credited to the Inter-oceanic Canal Company, incorporated in New Jersey. Omitting this one concern the record of incorporations last month would fall more than one-half below that of March, when the aggregated capitalization exceeded \$500,000,000. A feature of April was the relatively small number of industrial consolidations, not one really large concern of this character having been chartered.

The pulp and paper industry of Maine has grown to be more valuable than the granite, lime, slate and ice industries of the State combined. At present the output of pulp and paper is more than 1800 tons daily, and it is stated that within a short time it will reach 2500 tons daily, as a large number of new plants are being erected or are planned for.

The National Association of Manufacturers.

In our issue of last week we published a report of the proceedings of the Boston convention of the National Association of Manufacturers up to noon on Wednesday.

After further consideration of the report of President Theodore C. Search, the Committee on Resolutions, of which C. H. Harding was chairman, made its report. The first resolution presented had reference to a treaty between the United States and Canada and, as adopted by the convention, was as follows:

Resolved, That the National Association of Manufacturers earnestly petitions the President and Congress to endeavor as speedily as may be to have prepared and ratified a reciprocal trade treaty between Canada and the United States, which, by means of mutual concessions in duties, will give to the American manufacturers an opportunity to hold and extend their trade in the Dominion of Canada under tariff conditions quite as favorable as those accorded to any other nation.

Then came a resolution about car service, which, on motion of Frank Leake of Philadelphia, was tabled as being of small importance. One of the most interesting and timely resolutions had reference to China, and was adopted in the following form:

Whereas, It is of the greatest importance for the purpose of developing and extending the markets for American manufactured goods in China that there should be no barrier placed in the way of the entrance of our products into that country, and

Whereas, For the same purpose it is good policy to remove needless causes of irritation between the people of the two countries; therefore, be it

Resolved, That the National Association of Manufacturers of the United States heartily congratulates the present Administration, and particularly Hon. John Hay, the Secretary of State, on the successful termination of the brilliant and effective diplomatic effort to establish the principal of the "open door" system of trade in China.

Resolved, That we further believe that the advantages thus secured can best be maintained if our Government will accord to Chinese merchants coming to the United States the right, assured to them under treaty, of entrance into this country without needless hindrance or delay.

Another resolution which was adopted read in part:

Resolved, That the association heartily approves the laying and operating of competing cables between Cuba, Porto Rico and this country.

A resolution offered by Daniel A. Tompkins of Charlotte, N. C., was adopted approving the work done in the last year in the way of putting statistics and information before the Government departments and the committees and members of Congress, and it was decided to continue the work.

A most interesting matter was brought before the convention by Charles A. Schieren of New York on the subject of commercial education. Mr. Schieren said in part: "It has been a source of surprise to me that thus far nothing has been said regarding the subject of commercial education. Nothing is more important than the matter of educating our young men and fitting them properly for commercial pursuits. I think that a resolution should be drawn urging upon all educational institutions the necessity of this matter. Young men start out from this country to sell goods in Germany, the West Indies and other foreign markets, and they are immediately placed at a disadvantage through the fact that they do not understand the language of the country which they visit. On the other hand, the German salesmen, who are their competitors, are thoroughly equipped with not only a knowledge of the language, but also the requirements of the people. It is needless to state that they get the bulk of the business. Although the foreign buyer is anxious to see you and your goods, you actually hinder transactions by not being able to talk to him in his own tongue and present your goods properly. One of the weak spots in our commercial system is that we have not enough young men that we can send out to foreign countries and feel that they are presenting our goods properly."

William H. Cole of New York indorsed the sentiments expressed by Mr. Schieren and said that the tendency among young men of to-day was to immediately look for a position as head of the firm. He said that they were not satisfied to start at the bottom and get their hands soiled. He suggested that almost every man within his hearing began at the bottom of the ladder and said that the more that young men were taught the necessity of starting with the right idea and were equipped with the proper commercial education the more there will be who will really prove fit candidates for the better positions in business life.

Richard Young of New York, who is a member of the Brooklyn Board of Education, added to these remarks and closed by moving that a committee be

named, with Mr. Schieren at the head, whose purpose it should be to draft proper resolutions which should be presented before the convention adjourned. The motion was carried, with an amendment by D. A. Tompkins of North Carolina, to the effect that the resolution should include technical as well as commercial education.

Speech making occupied the evening session. John C. Eames of New York made the first speech, his topic being "Foreign Trade in American Cotton Goods."

"Possibilities of Foreign Trade in American Shoes" was the topic of a discourse by Hon. Wm. B. Rice of Boston.

Following Mr. Rice's address Richard Young of New York spoke on "The Evolution and Possibilities of Export Business."

The closing feature was a presentation of packing goods for export, illustrated by stereopticon slides by Edward H. Sanborn of Philadelphia.

THURSDAY'S SESSION

brought the business end of the convention to a close. Final action was taken on many important matters, officers for the ensuing year were chosen and the place for the next convention was selected. In the contest for the next convention Detroit carried off the honors. It was not without a struggle, however, for there were standing in line several other cities whose representatives were equally as anxious for the big meeting as were George H. Barbour and Mayor Mayberry of Detroit, who espoused the cause of their city. The decision was arrived at by the following ballot: Detroit, 57; Milwaukee, 21; Pittsburgh, 14; New Orleans, 11, and Buffalo, 7.

Theodore C. Search was unanimously re-elected president of the organization, and Mr. Schieren of New York made a neat speech of presentation as he handed the president a handsome silver loving cup, presented by the members in session. In his remarks Mr. Schieren suggested that there was a neat surplus which was to be donated to the technical institution in Philadelphia in which President Search is very much interested. Charles A. Schieren was re-elected treasurer, and E. P. Wilson of Cincinnati was again accorded the secretaryship.

The following were elected vice-presidents:

Alabama, A. S. Benn; California, J. C. Hamilton; Delaware, C. W. Pursy; Georgia, J. F. Hanson; Illinois, C. F. Quincy; Indiana, D. M. Parry; Kentucky, Mr. Nownes; Louisiana, Mr. Young; Maine, C. R. Milliken; Maryland, Somerfield Baldwin; Massachusetts, G. T. Coppins; Michigan, G. H. Abbott; Mississippi, W. T. Adams; Missouri, Referred to Executive Committee; New Hampshire, E. B. Pike; New Jersey, Benjamin Atha; Montana, B. H. Tateham; New York, Richard Young; Ohio, H. C. Yeiser; North Carolina, D. A. Tompkins; Pennsylvania, D. C. Ripley; Rhode Island, L. G. Goffe; South Carolina, E. A. Smythe; Tennessee, C. D. Mitchell; Connecticut, L. B. Jewell; Vermont, Henry Fairbanks; West Virginia, Mr. Lockwood; Wisconsin, F. N. Slyver; Virginia, Referred; Iowa, Referred; Texas, Referred; Washington, I. C. Atkinson.

One subject brought forth heated discussion while the shades of evening were approaching on Thursday. It was regarding the reciprocity treaty with France. A. B. Farquhar of York, Pa., opened the discussion by the reading of a voluminous report showing the inequality of the tariff rates between this country and France and *vice versa*. He endeavored to show to the delegates the advantages to be gained by American manufacturers through the treaty now pending before Congress with France, and urged the adoption of the following resolution, which was presented by the Committee on Resolutions:

Whereas, The National Association of Manufacturers has at its previous conventions declared in favor of the principle of reciprocity and of reciprocity treaties, and

Whereas, A reciprocity treaty is now pending before Congress with France, and

Whereas, Their Government has now in effect a maximum and minimum tariff, the minimum tariff approximating 26½ per cent. less than the maximum tariff, and

Whereas, France admits manufactured goods from all commercial nations except United States and Portugal at the minimum rates, and

Whereas, The United States supplies over one-third of all goods imported into France upon which the French Government has but one tariff rate, and

Whereas, The total imports into France for the year 1898 were \$117,000,000, upon which either the maximum or minimum tariff applies, of which the United States supplies only \$4,000,000, and

Whereas, It is estimated that if the pending reciprocity treaty with France is ratified that our exports to France would be \$30,000,000 per annum, instead of \$4,000,000,

Therefore be it resolved, That this association in convention assembled does hereby recommend the ratification of the reciprocity treaty now pending between the United States and France; that it reiterates its former declarations in favor of reciprocity treaties, as provided for by the present laws of the United States.

C. H. Harding of Philadelphia spoke in behalf of the cotton goods manufacturers, and pointed out the fact that the ratification of the treaty would be an injustice to this branch of trade. He then offered the following amendment to the resolution:

Provided, There be withdrawn from the treaty the concessions offered on cotton hosiery and print goods and other like concessions, such concessions being in direct antagonism to the basic principle of reciprocity, which is the freest possible exchange of non-competing goods.

This amendment was lost by a vote of 47 for and 66 against.

William C. Barker of New York spoke in favor of the treaty and the resolution before the house, and he was fortified with considerable data which supported his argument. Mr. Barker referred to the machine tool industry, saying that its only hope of an extended French trade lay in the ratification of the treaty. American machine tools, said he, are being extensively copied in Germany, and owing to the existing tariff rates between this country and France the German copies of the American tools are being purchased in preference to many of the genuine ones. He referred to a large motto which embellished the front of the convention hall, reading, "Trade Follows the Flag." The association should approve the reciprocity treaty, he said, or we'll have no trade to follow the flag.

The original resolution was adopted, with the following addition, which was proposed by William McCarroll of New York:

The matter of discrimination against the hosiery, leather, boot and shoe and other large interests discriminated against be brought before the Secretary of the Treasury and Committee on Foreign Relations, with the request that these interests be furthered, if possible, by the framing of a supplementary treaty.

Regarding the building of an isthmian canal the following resolution was adopted:

Resolved, That the National Manufacturers' Association urge upon the Administration and Congress at Washington that the immediate construction of a ship canal across the Central American isthmus is of the utmost importance to the development of American commerce in the same proportion as our agriculture, manufactures and other industries are growing.

We recommend that this canal shall be built, owned and controlled by the United States of America.

We recommend further that, subject to the condition of construction, ownership and control by the United States, in the prosecution of this great undertaking every care be taken to insure for the canal its freedom at all times from the vicissitudes of war, and to secure the commerce in it from interruptions or interference of any sort or at any time.

We recommend that a permanent committee of eleven be appointed by the president, geographically distributed, to assist the officers of this association in the prosecution of this work.

A resolution indorsing the creation of the Department of Commerce and Industries was adopted in the following form:

Whereas, The creation of a department of the National Government under the name of "Department of Commerce and Industries" has been agitated in Congress for several years, and has at each succeeding convention of this association met with the unanimous approval of its members, and

Whereas, The creation of such department seems not only necessary to the development of American industries, but indispensable for the purpose of bringing under the control of one department all those matters pertaining to the continuous growth of our foreign commerce, as well as the expansion of our home industries, which, on account of their previous control by at least three different departments of Government, have frequently suffered from delay and confusion.

Be it resolved, That this association in national convention assembled most heartily and emphatically indorse Senate Bill No. 738, providing for the establishment of the Department of Commerce and Industries, and most respectfully petition the Congress to pass the same during its present session, so that the next Administration may be inaugurated and installed with power to put this new department in full operation.

The Committee on Technical Education presented the following resolution, which was adopted:

Recognizing that the future prosperity of the United States depends in a large measure on the ability of its manufacturers and merchants to intelligently conduct foreign trade and business of a complex character, and that to secure this end it is desirable to place within reach of the young facilities for securing comprehensive business education. Therefore be it

Resolved, That the National Association of Manufacturers at its fifth annual convention, assembled in the city of Boston, on the 26th day of April, 1900, advocates the establishment of free public commercial and technical schools, colleges and educational institutions with comprehensive courses of study, and requests its members to use their earnest endeavor to secure the establishment of such schools or departments in the cities and States which they represent.

A resolution supporting the measures now before Congress for the encouragement of the American merchant marine was adopted. It is as follows:

Whereas, The information laid before this association by its president indicates that the bills known as Senate bill No. 727 and House bill 64, now before Congress, have received careful and deliberate attention from able committees both in the Senate and House of Representatives, and have been recommended for passage by a majority of each committee, and

Whereas, The practical intent of said bills is to increase the volume of American shipping available for foreign trade, to provide cruisers and transports for Government use in time of war, to furnish free transportation of mails to foreign ports, to educate in seamanship and marine knowledge American youths, and encourage fisheries under the American flag.

Resolved, That each object as enumerated has the approval of this association as calculated to enhance facilities for the movement of our foreign commerce.

Resolved, That this association, feeling the importance of early realization of such advantageous conditions, earnestly urges upon the present Congress conclusive action by the enactment into law of said bills.

THE BANQUET.

On Thursday evening the closing function of Boston's welcome to the manufacturers was held in Mechanics' Building. Covers were spread for almost 1000 guests, and more than twice that number of spectators thronged the galleries.

Roger Wolcott, ex-Governor of Massachusetts, presided. Speeches of welcome were made by Governor W. Murray Crane of Massachusetts and Mayor Thomas N. Hart of Boston. President Theodore C. Search spoke on the interdependence of our industries. Lyman J. Gage, Secretary of the Treasury, explained the scope and meaning of the new legislation regarding the island of Porto Rico. Secretary of War Elihu Root told what the army is doing for the people of Cuba and the Philippines, and Secretary of the Navy John D. Long rejoiced with the manufacturers that in every effort put forth they are making an age of highest civilization. Lieut.-Gov. Timothy L. Woodruff of New York set forth the advantages which will accrue from territorial expansion. Wu Ting Fang, the Chinese Minister to the United States, gave the manufacturers suggestions as to methods which should be pursued in securing a share of the great trade of the Celestial Empire. American merchants, he said, should bring their goods to China, where there was a great market for them. He heartily indorsed the manufacturers' project of establishing a warehouse at Shanghai. He said that the empire had great resources and that Americans were most welcome. He also said that if Americans are to make good their claim to a due share of the commercial advantages in China it is essential that they should revive their carrying trade on Chinese waters. A number of speeches were made by other gentlemen on various interesting topics.

Concessions in Freight Rates.

Authorized concessions in freight rates are being made on much of the metal traffic of the roads of the Trunk Line and the Central Freight association's territory. One class of traffic after another has been taken up, until the entire list has been fairly well covered, and most of the advanced rates made the first of the year, excepting; perhaps, the bulk of traffic from the Pittsburgh district, including steel shipments and coal, have been reduced in the new tariff which has been filed.

The scrap iron rate, which was advanced along with other iron rates on the first of the year, has been shaded to meet exigencies of local conditions in a number of instances. The advanced rate was sixth class, and these rates on shipments from Fort Wayne and other points in the Central Freight Association territory have been dropped and special commodity rates put in. The new rate from Fort Wayne to Pittsburgh and Allegheny has been made \$2.40 per gross ton, and corresponding reductions have been made to other points in the Central Freight Association territory.

A sharp reduction has been proposed on the rates on pig lead and spelter shipped from the West and Southwest to Pittsburgh and other points. The rate has been 18½ cents from East St. Louis to Pittsburgh and other Western termini of the Trunk Line Association territory. The proposition is to make the basis on these shipments in carloads 17½ cents per 100 pounds, Chicago to New York. This will make the rate from East St. Louis to Pittsburgh 13 cents per 100 pounds. Lines of the Central Freight Association are now voting on the proposition.

The Colombian Government has extended by six years the time for the completion of the Panama Canal.

The Iron Age

New York, Thursday, May 3, 1900.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

The Index Supplement in Practice.

Our readers will not be surprised to learn that *The Iron Age*, with its universal circulation and high position as a trade journal, receives a great many inquiries as to the names and addresses of manufacturers of certain specified goods. These inquiries are, of course, chiefly from correspondents in the different States and Canada, but quite a large number are received from abroad, indicating the practical interest taken by foreign houses in American manufactures. Replies to these queries sometimes involve considerable time and labor, but with our versatile resources, including what is undoubtedly the largest collection of literature in the world relating to the iron, machinery and hardware trades, we are able in most instances readily to supply our correspondents with the information desired. To these appeals for the addresses of manufacturers in the broad field covered by *The Iron Age* we are very glad to respond, and we trust our readers will avail themselves freely of our facilities for service in this direction.

We, however, allude to this matter at this time especially in its relation to our Index Supplement, by means of which we are frequently enabled to answer inquiries without tapping any of our other sources. For instance, in a single mail one morning last week we had five inquiries for information as to manufacturers of specified goods which we were able to answer by consulting only *The Iron Age Index Supplement*.

One of these is from a manufacturing concern in Illinois, and requests the names of manufacturers of German silver wire rods and tubing. Consulting the Index Supplement, we find under "Tubing, German Silver," the names of three prominent manufacturers in this line. Under "German Silver" seven sources of supply are given.

Another inquiry is from a motor vehicle manufacturing concern in New York State, who inquire for makers of "copper or steel air receivers, about 10 inches in diameter and 20 to 30 inches long." This information is furnished at once by the Index Supplement, in which under "Bottles, Steel," we find the names of five concerns in a position to supply these goods, and under "Receivers, Air," four manufacturers.

The third correspondent, a well-known Nova Scotia jobbing hardware house, is looking for a reliable manufacturer of brass rowlocks. The information is secured at once by turning over the pages of the Index Supplement to "Rowlocks," where manufacturers are named of unquestioned reliability.

Another inquiry is from a large retail hardware house in Florida who are, not unnaturally, looking for manufacturers of machinery for making ice. The Index Supplement supplies the information instantly under the heading "Ice Machinery."

Still another inquiry, this time from a firm in the Nutmeg State, is for makers of iron fences. By means of the Index Supplement we are able to supply our corre-

spondents with the names of a large number of the leading manufacturers in this line.

The Index Supplement is thus of great service to its compilers as well as the trade, merchants and manufacturers, for whom it is intended. With its more than 5000 headings, representing the products of 1100 advertisers, it is undoubtedly the most useful directory of its kind published.

With this issue of *The Iron Age* a revised edition of the Index Supplement is being mailed to every subscriber. We trust it may serve the convenience of the trade at home and abroad.

Congressional Action Relative to Porto Rican Corporations.

The House Committee on Insular Affairs has afforded the country much harmless amusement by amending the joint resolution on Porto Rico, to provide that stock issues of private corporations in that country shall hereafter contain no water. The amended resolution provides "that all charters of private corporations * * * shall forbid the issue of stock or bonds except for actual cash, or property at a fair valuation and equal in amount to the par value of the stock or bonds issued; shall forbid the declaring of stock or bond dividends," &c. As an experiment in economic legislation this is full of interest, not because it is a new idea in the governmental regulation of corporations, for it is not, but because it shows how little of practical knowledge is needed in making laws for a colony.

Nearly all the State laws relative to business corporations provide that stock shall be issued only for value, in the shape of money or money's worth in property purchased or services rendered. As the rule, stock issued for money by corporations must be sold at its par, or nominal, value. Curiously, there is no provision for its sale at any price above par. Stock issued for property or services is also supposed to be issued at par, but property or services may be valued as much above par as the directors of a company may be pleased to consider them worth. In some States the overvaluation of services or property is sought to be guarded against by making them purchasable only in money. This merely introduces another operation into the transaction, and probably gives the key as to how the scheme of dilution will be worked in the case of Porto Rican corporations. The person with property or services for sale is impressed with the excellence of the enterprise and subscribes for such amount of the company's stock as is needed by the promoters for what is technically known as "sugar," giving his check in payment therefor. The directors thereupon discover that they need his property or services very much, and, with some circumlocution, tender him in purchase thereof the check he has given in purchase of stock. This is satisfactory, of course. No one knows the value of a check, and the extent to which it represents cash, as well as the maker. The property is transferred or the services rendered, and it is a cash transaction throughout. For this purpose a check on the "bank whereon the wild thyme blows" is as good as one on the Chemical National or any other financial institution. Stock once issued at par for money, property or services, may be given away or sold again for any price the owner pleases. This opens a water gate wide enough to let in the Gulf Stream, if there are properties or services enough to absorb it.

Patents and license rights are favorite kinds of property for purchase. Having no intrinsic or ascertainable

value, it is difficult, if not impossible, ever to show that, if overvalued for purposes of purchase, such overvaluation was anything but an honest error of judgment on the part of the directors. The value of services is also a matter of judgment. Franchises admit of any valuation which may be put upon them, since every franchise has in it potentialities of profit which confuse statistics and baffle prophecy. That these may not be realized is one of the accidents of business. To restrict or deny the right of directors of companies to purchase property or pay for services would, obviously, render corporate management impossible. On the other hand, if the exercise of this right was subject to review, under any sort of certiorari proceedings, save on the allegation of fraud, no responsible man would consent to serve as a director of a company. The law presumes honesty in corporate management, but it cannot presume infallibility of judgment on the part of the managers. To err is human, and no larger opportunity for error exists than in the valuation of things which have no ascertainable value, but in which reside the potentialities of immeasurable profit, if these can be materialized. On such estimates—the "large desires with most uncertain issues" of the poet—most stock companies are floated.

As to the provision of the Porto Rico resolution forbidding stock and bond dividends, there is also much to be said. So far as bond dividends are concerned, we don't remember ever to have heard of them, nor is it probable the House Committee ever did. It would be something new in corporation finance, and we are frankly sorry it has been suggested. A bond assumes the existence of a mortgage, in which its security lies, and to mortgage the property of a company to pay a dividend in the shape of interest bearing bonds, swelling the annual fixed charges and, in the event of default of the interest, giving the stockholders the right to foreclose on their own property, would be so novel a procedure as to possess great attractions for some of the Napoleons of finance. Common stock dividends, on the other hand, are often justified by the investment of net earnings which belong to the stockholders, in improvements, extension and betterments which increase the earning power of a corporation. That kind of water in stock issues is not usually considered objectionable by any one in interest, and if made illegal in the case of Porto Rican corporations, some new method of reaching the same end must be devised. To keep the stock issues of our colonial enterprises absolutely anhydrous, so to speak, will require means supplementary to the simple expedient of "be it enacted."

But, if possible, is it quite certain that the result sought would be altogether desirable? Water has a function in nature which is peculiarly and exclusively its own. It is the universal solvent, the universal carrier and distributor. It promotes solidification and is essential to crystallization. As a lubricant it is cheaper than oil, and often better. It has great powers of floatation and offers less resistance than any other material of comparable specific gravity. Without water this comfortable and prosperous earth would become like the moon—a dead clnder ball, offering no opportunities to successful exploitation. In the world of finance "water" has much the same functions as in nature. Without it very few undertakings would take shape or crystallize, and most of them now existent would crumble into the dust of efflorescence. Too much water in either nature or finance is, of course, destructive of solidity, and tends to deliquescence; but it will require something more than an act of Congress to keep water out of places to which it gravitates in obedience to the law of its being.

The Consular Service.

A most interesting contribution to the perennial discussion of the consular service of the United States has been made by George F. Parker in the *Atlantic Monthly* for April and May. Mr. Parker is well qualified for such an undertaking by five years' service as Consul at Birmingham and a previous journalistic training. He therefore understands thoroughly what he is writing about and knows how to express himself. Without asperity, evidently having no grudges to feed, he carefully analyzes the work done by our consuls, points out that which is commendable and should be continued, sets forth much that should be eliminated from their duties and suggests a practical reformation of the service. We shall not attempt in the brief space permissible for this article to take up all the important points made by Mr. Parker, for that would involve the reproduction of almost his entire paper, but will merely allude to a few of the most striking.

Much useful information, he says, is furnished to home manufacturers, but it is not always appreciated, in many cases not even acknowledged. No consul would think of making a charge for it, but many persons at home have yet to learn that there is such a thing as good manners in business. This is something for our manufacturers to bear in mind when they write to any of our consuls for some special information.

It is the general presumption that because our consular service represents appointments made almost wholly as rewards for party service, it is therefore inefficient. Mr. Parker says that taken in its entirety it reaches a good average of efficiency, higher than that of most countries. Although the Secretary of State, theoretically, appoints consuls and supervises their work, he does neither. The work is supervised by the chief of the Consular Bureau, who is usually a clerk trained in the department. Although nearly everything that a consul does concerns the Treasury Department, all communications must pass through the Consular Bureau, causing great delays in receiving information of changes in tariff laws, &c. He recommends that the supervisory authority be made of much more importance.

Mr. Parker strongly condemns the report system in vogue, including the daily advance sheets sent to newspapers. He says there is no room for this flood of commonplace writing nor for the fortieth part of it. He says, for instance, that for the past ten years many consuls, in every part of the world, have been writing about American machinery and tools, but, in spite of this, not even one report furnished real and new information on the outlook, a result due less to lack of knowledge than to the narrowness and shortness of view incident to the man who writes from the observation and experience of a district with perhaps a single industry.

He says the consular service belongs logically to the Treasury Department, being concerned almost wholly with commerce. But the Treasury Department is overwhelmed with work. If a Department of Colonies or Commerce should be organized, the service might be transferred to it to become the chief corner stone of a new executive department rather than remain the neglected or rejected of the diplomatic builders.

He argues in favor of the abolition of the consular invoice, which is both inquisitorial and ineffective as a method for determining values at the place of origin or manufacture. When merchandise arrives at its destined port, an elaborate and expensive system of appraisement is maintained for determining values. If no question is raised, the consular invoice becomes a simple bill of

lading and is therefore unnecessary. In a dispute, it counts for nothing.

The scheme of reorganization which he outlines provides for consuls-general, for consuls of two classes, for vice-consuls of two classes, for an exclusively American clerical force as the staff, and for student interpreters in Eastern countries. In Great Britain, for instance, now having more than a hundred commercial representatives, he would reduce the number to less than half, placing a consul-general in London, consuls in Birmingham, Liverpool, Manchester, Bradford, Glasgow and Belfast, and vice-consuls at ten other points tributary to these as trade centers, abolishing all consular agencies held by foreigners. Each country or in some cases groups of countries would be provided with a service of this character but varied according to conditions. Appointments would be made to vice-consulates of the lower grade and promotions thence to the higher grades. As the terms of those with consular rank expired, or as they died or resigned, the President would fill the vice-consulate vacancies without the necessity of sending the names to the Senate for confirmation. No inexperienced man could thus be appointed to the higher grades. He does not recommend an examination for applicants, but makes very practical suggestions on this point. The tenure of office he would limit to one year for the service of vice-consuls on probation and six additional years in the various grades through which they may pass.

The consuls thus appointed should be given opportunities to visit American industries akin to those in their districts and be required to visit the principal places in their districts every year for the purpose of studying with care the manufacturing, commercial and agricultural interests, so as to be able to report on them, when necessary, in no chance or haphazard way. The consuls, relieved from useless office drudgery, with efficient staffs of assistants drawn from home, Mr. Parker believes, would thus be able to do their work with system and intelligence. The reports then made would be of value. He suggests plans for the preparation and publication of such reports.

Mr. Parker's paper should be read, and its statements and recommendations weighed carefully by all who are interested in the improvement of our consular service. We have now arrived at such a point in our industrial development that we are building up a great export trade in manufactured products. Through our consular service, properly organized and constituted, the efforts of our manufacturers could be greatly assisted in ascertaining the conditions existing abroad and the necessary measures to develop and hold their export trade. That service should be made a far more valuable adjunct to our commercial system than it now is.

The Canadian Calamity.

The greatest fire in the history of Canada, and one of the most serious that ever afflicted a city of this continent, occurred at Ottawa and the neighboring city of Hull on Thursday last, the 26th ult. The loss of life was fortunately not large, probably seven deaths covering the list of such casualties, a number which has often been exceeded in conflagrations of much less extent. But it is estimated that 20,000 people have been rendered homeless and that the destruction of property will amount to from \$15,000,000 to \$17,000,000. The greater part of Hull, with its numerous industrial establishments, was obliterated, but much less damage was done in Ottawa, owing to a fortunate change in the direction of the wind while the conflagration was at its height. All

the fire fighting appliances that could be brought into requisition would otherwise have been powerless to save Canada's beautiful capital city. The destruction of industrial establishments is a very serious blow to the suffering population, as the means of earning a livelihood has thus been taken from thousands of homeless people who will for a time be dependent upon the benefactions of their more fortunate fellow creatures elsewhere.

Contributions are being forwarded from the mother country across the ocean and from numerous cities in this country. These contributions should be most generous, particularly from the United States. Canada is bound to us by so many ties—social, sentimental and commercial—that the outpouring of assistance to her stricken people should be immediate and unstinted. The United States has been favored with abounding prosperity and can afford to be exceptionally liberal just at this time. It should be a pleasure to our open handed and large hearted citizens to give generously from their abundance to our afflicted neighbors. They should be assisted to such an extent that they will not only be relieved from immediate destitution and most pressing distress, but will also be able to set themselves vigorously at work to repair the damage that has been done to their material interests. Canada's welfare is closely connected with our own, and we should extend not merely condolence but substantial expressions of our sympathy.

British Iron Trade Statistics.

The report of the British Iron Trade Association for the first quarter of the present year shows that the blast furnaces in the United Kingdom produced 2,356,367 gross tons of pig iron, which is at the rate of 9,425,468 tons a year. This is a material increase on the production in 1899. From the reports of James Watson & Co. of Glasgow, Scotland, it appears that the stocks of pig iron in all the public stores in the United Kingdom are now decreasing at the rate of at least 15,000 tons weekly. All told, these stocks amounted to only 315,000 tons the middle of April. Should withdrawals continue at this rate the early exhaustion of this reserve supply is assured. British exports of pig iron to all countries in 1899 were 1,379,296 tons, or about one-third more than in 1898. In the first quarter of the present year the exports were 379,263 tons, or at the rate of over 1,500,000 tons for the year. These figures strikingly demonstrate the excellent condition of the British pig iron trade and explain the rising tendency of British pig iron prices. They are exceedingly encouraging to Americans who are watching the trend of trade in international markets and hope to see our own exports of iron and steel greatly increase.

CORRESPONDENCE.

The Diffusion of Sulphur in Malleable Castings.

To the Editor: As it is by the constant exchange of ideas that the truth of any subject is ascertained, I wish to make a few remarks regarding the article by George C. Davis on malleable castings, published in *The Iron Age* under date of March 8. In speaking of the diffusion of sulphur, he attributes the gain of this element to the absorption of sulphur from the packing material during the annealing. I hope to show that this gain is largely suppositional, and that a casting does not gain in this element wholly from this source.

It is taken for granted that the sulphur determinations cited by Mr. Davis were made by the well-known evolution method, which at best is not accurate. I have found by repeated experiments that an error in a sulphur determination by this method is augmented by the physical condition of the iron. At least this has been my experience with Bessemer irons. In an article published in the *Journal of the American Chemical Society*,* some results were given that proved my point without a

* Volume 21, 1899

doubt. It has always been held in malleable iron practice that a casting picked up sulphur during the annealing. Before a casting is annealed the carbon is largely in the combined state, rendering the iron white; while, after going through the annealing process, this element is nearly all in the graphitic state.

It is well known that when pig iron is dissolved in hydrochloric acid, as in the evolution method for sulphur, difficultly oxidizable hydro-carbons are liberated, known as the mercaptans, which pass through and are not absorbed by any solution known at present to the analytical chemist.

My theory is that, in the case of white irons, the difficultly oxidizable hydro-carbons are liberated in greater quantities, and combine with more sulphur, producing a loss in this element greater by about 50 per cent. than in the case of gray irons, in which a large percentage of the carbon is in the graphitic state, hence the proportion of the hydro-carbons is less, and it naturally follows that the error in sulphur by evolution would not be as great when analyzing gray iron as in white iron.

To substantiate this theory some results are given below that were obtained from pouring molten metal into water, and a portion was poured from the same hand ladle and from the same iron into a sand mold. This method was adopted in order to get samples that would analyze the same in sulphur.

Shot Samples from Mixer.

Number.	Volumetric method.	Grav. method.	Difference.	Sulphur in residue.	Volumetric sulphur plus residual.	Column No. 2 minus column No. 5.	Sulphur in steel.
1.....	0.056	0.081	0.025	0.005	0.061	0.020	0.083
2.....	0.064	0.096	0.032	0.008	0.072	0.024	0.103
3.....	0.070	0.103	0.033	0.008	0.078	0.025	0.106
4.....	0.073	0.103	0.030	0.006	0.079	0.024	0.106

Sand Samples from Mixer.

Number.	1	2	3	4	5	6	Sulphur in steel.
1.....	0.068	0.081	0.013	0.011	0.079	0.002	0.083
2.....	0.080	0.098	0.009	0.007	0.096	0.002	0.103
3.....	0.087	0.103	0.016	0.008	0.095	0.008	0.105
4.....	0.088	0.103	0.015	0.005	0.093	0.010	0.106

It will be observed from this table that the sulphur was determined by both the evolution method and the gravimetric, the latter being used to arrive at the total sulphur in both cases. It will be seen from column No. 1 that by the former method there is a discrepancy of from 0.012 per cent. in sulphur to 0.025 per cent., while the total sulphur given in column No. 2 remains practically the same.

In column No. 4 the sulphur was determined in the siliceous residue; this, deducted from column No. 3, gives us the sulphur combined probably with the hydro-carbons.

It will also be noted by referring to column No. 6 that the amount carried over by the mercaptans is very much less under sand samples than it is for shot samples.

My original work along this line was to prove the unreliability of shot sampling, which is the method in vogue at most furnaces for taking samples for the regular routine daily analysis.

I do not wish to go on record as saying or claiming that a malleable casting does not pick up any sulphur during the annealing, as this can only be found out by experiment, but I do claim that if chemists will work along this line, which I have been pursuing, they will find, as said before, that the gain of this element, sulphur, is largely conjectural owing to the physical properties of the iron before and after annealing.

The motive in making these remarks is to cast a ray of light, as it were, on this one perplexing sulphur question and not as a criticism, and it is therefore earnestly hoped they will be so considered. MILTON J. MOORE.

JOLIET, ILL., April 21, 1900.

Record of the National Steel Company's Furnace.

To the Editor: I noticed in *The Iron Age* of April 26 the following: "The new blast furnace of the National Steel Company at Youngstown, Ohio, made 716 tons on the 22d inst. The furnace has worked up to 600 tons a day several times, and now after being in blast a little over two months is getting a 700-ton gait."

I much regret this notice, as it is only partially true. The 716 tons was reported on the 21st, and was as follows: To mixer, 199 ¹⁰⁰⁰/₂₃₄₀ tons; to pig machine, 470 ¹⁴⁸⁰/₂₃₄₀ tons; ladle scrap, 4.0320 tons; to cast house scrap, 41 ¹⁷⁰⁰/₂₃₄₀ tons. Deduct cast house scrap, which was an accumulation of several days, and you have an output of 674 ⁸²⁰/₂₃₄₀ tons for the day's report. The day in this case was also a long day, and when reduced to a 24-hour day brings the tonnage down to 606 ¹²⁸⁰/₂₃₄₀ tons.

The average output for the past week is a good one,

and is 624 ¹⁰⁰⁰/₂₃₄₀ tons. We hope to beat the best record, but will endeavor to do so honestly.

THOMAS McDONALD, General Superintendent.
YOUNGSTOWN, OHIO, April 28, 1900.

Canadian News.

The Proposed Ontario Mineral Tax.

From all parts of New Ontario the Provincial Government's bill to amend the mining act has called forth vehement protests. The feature that excited most opposition was the tax on minerals. To oppose this an influential deputation came to Toronto from Sudbury. It was joined by a few prominent men from Port Arthur, and the Board of Trade of the latter town sent a strongly worded resolution, taking special objection to the proposed tax on iron ore. After hearing the views of the deputation the Commissioner of Crown Lands agreed to withdraw all the taxes except that on nickel-copper ore and matte. That remains, though it was as strongly condemned as any part of the arrangement. Several of the deputation were opposed to any tax, conditional or unconditional. Others were in favor of a tax, not on the mineral product of the land, but on the land itself. Still others declared that they would be satisfied with a tax with an accompanying refund for refining in Ontario, but they desired that such an arrangement be positively established and not left uncertain. As the measure stands it is provided that there may be a tax—that is to say, there is to be one only if the Lieutenant-Governor in Council proclaims one as authorized by the act. And he may, in his discretion, make it the full amount specified in the act or as much less as he considers fair. Further, he may remove it again at his pleasure. With the taxing power in such an absolutely precarious state investors would be disinclined to venture into nickel-copper lands. Negotiations for the purchase of several mining properties by Americans have been broken off in consequence of the tax proposals. The Commissioner of Crown Lands has hinted pretty plainly that the tax will not be imposed, but the mere presence of a clause in the act enabling the Government to precipitate the tax at will is disturbing.

At a meeting of New Ontario mining men in Toronto on April 24 the taxing clause was discussed and condemned by all but F. H. Clergue of Sault Ste. Marie and S. J. Ritchie of Akron, Ohio. Mr. Clergue declared that if the nickel ores were allowed to leave the country free the big refining and nickel-steel works which his company are now planning for the Canadian Sault would be transferred to the American side of the line, where they are now building a power canal. He maintains that the Canadian Copper Company were in error in their belief that the matte could not be refined economically in Canada. He assured the Sudbury delegation that by July 1 next he would be prepared to buy ore from them in car-load lots.

Malleable Iron Works at Brantford.

The Canadian branch of the Pratt & Letchworth Malleable Iron Works Company, at Buffalo, has just been formerly opened in Brantford. The plant is installed in the buildings formerly used by the Grand Trunk Railway Company as car shops. The company will manufacture iron and steel castings for railroads, for locomotive builders and for manufacturers of electric lighting machinery and of agricultural implements. In the Buffalo works 1500 men are employed. About one-tenth of that number will be employed in the Brantford works. A very considerable business had been built up in Canada by the Buffalo company, and it became desirable to establish a manufacturing branch here.

Stove Manufacturers' Amalgamation.

There seems every likelihood that the efforts being made to amalgamate the stove manufacturing companies of Canada will be successful. Apparently the leading manufacturers are satisfied that the promoters represent solid men, for several of the former have set a value upon their works. Experts appointed by the promoters are taking stock of the several properties in Hamilton, which include the following: The Gurney-Tilden Company, Copp Bros., Burrow, Stewart & Milne, the Bowes-Jamieson Company and the D. Moore Company. They are also taking stock of the McClary Company of London, the Buck Company of Brantford, Clare Bros. of Preston, James Stewart of Woodstock and the Smart Company of Brockville. Besides these, the smaller foundries, which are very numerous throughout Ontario, are invited to join. American and Canadian capital is behind the undertaking.

Bounty Payments.

According to the report of the Dominion Auditor-General there was paid out last year in bounties on pig

iron, steel ingots and puddled bars \$280,109.65. This was distributed as follows: To the Canada Iron Furnace Company, \$20,480.93; to the Hamilton Blast Furnace Company, \$96,069.98; to the Nova Scotia Steel Company, \$138,755.69; to John McDougall & Co., \$812.03; to the Deseronto Iron Company, \$6480; to the Ontario Rolling Mills Company, \$17,511.02. Besides what they received from the Dominion Treasury the Hamilton Company received \$8647.19 in bounties from the Ontario Government. Of the 82,330 tons of pig iron and puddled bars produced 36,145 tons were made from Canadian ore and 46,185 tons from foreign ore. The Hamilton Company made 12,825 tons from Canadian ore and 28,792 tons from imported ore.

Minor Notes.

Provisional contracts have been let for the construction of the Quebec bridge. The Phoenix Iron Company of Phoenixville, Pa., get the work of building the superstructure of a cantilever bridge. It is provided that if the price of steel falls the Quebec Bridge Company are to get the benefit of the decline.

In a speech delivered a few days ago in the House of Commons Dr. Sproule, one of the Ontario representatives, asserted that a hardware combine existed in Canada. Certain axe manufacturers, he said, agreed to give a rebate of 17½ per cent. to those customers who signed an agreement to purchase all their stock from members of the hardware combine. As a result of this arrangement, he declared, the price of axes had been advanced from \$4.80 to \$5.75 per dozen, and the retail men are compelled to sell them at a specified price.

Every man of the Canada Foundry Company's works in Toronto has gone out on strike. The men of the Polson works are still out. The strike among the Toronto boiler makers continues. It is nearly impossible to get men to take the place of the striking molders, machinists and boiler makers.

An important discovery of iron ore deposits has been made near Tache, on the Canadian Pacific Railway. Several hundred acres of magnetic iron ore have been located there. Surface assays show metallic iron running up to 60 per cent.

A contract has been awarded for the building of the ore dock at Michipicoton for Clergue's Algoma Central Railway.

The Maritime Nail Company of St. John, N. B., showed 34 per cent. earnings at their annual meeting, 10 per cent. being distributed as dividend. C. A. C. J.

OBITUARY.

A. S. HALLIDIE.

Andrew S. Hallidie, president of the California Wire Works and the builder and inventor of the first cable car system in the United States, died on April 26, at his home in San Francisco, Cal., aged 73 years. Mr. Hallidie was a native of Scotland.

GEORGE M. EDDY.

George M. Eddy, senior partner of George M. Eddy & Co., died at his late residence in Brooklyn, N. Y., Tuesday, April 24. He was born in Dudley, Mass., October 4, 1818. He came of a line of Plymouth Pilgrim ancestors, reaching back to Roger Williams. From this ancestry he inherited his longevity, industry, frugality, honesty and firm adherence to principle. His native energy was manifested by his entrance upon a business career at the age of 17 as a clerk and assistant post master in a country store. In 1844 he came to New York and began the manufacture of measuring tapes in a small way. In the tape measure business a rotary printing press was required, Mr. Eddy inventing one to supply the need and employing R. Hoe & Co. to build it, which he once said was the first rotary printing press made, and that all the later presses built by that great company followed the principle developed in his machine. In 1862 the business was removed to Terryville, Conn., but remained there but a year. In 1866 Mr. Eddy purchased ten city lots on Classon avenue, Brooklyn, where he built a factory, the capacity of which was from time to time increased as the business demanded. What is now an important business came into existence through Mr. Eddy's connection with publishers of fashion plates in Boston and New York, for whom at different times he traveled in New England, selling fashion plates, &c., and a patent measuring apparatus to tailors. As the work occupied only the spring and fall months, and noticing the demand for tailors' measuring tapes, all of which were imported, he began their manufacture in a modest way in the unoccupied intervals of his time, taking along on subsequent trips a small stock of his goods, of which he made sufficient sales to defray all his traveling expenses, leaving his commissions on the reg-

ular lines a net profit. Mr. Eddy was one of the originators of the Union League Club in Brooklyn, and one of the founders of the Bedford Bank, of which he was a director until his death. He also occupied other positions of honor and responsibility. His sons, Col. John G. and Major William H. Eddy of the N. G. S. N. Y. survive him.

THOMAS SANDS.

Thomas Sands died at his residence in Nashua, N. H., April 18. While Mr. Sands was probably best known through his connection with the White Mountain Freezer Company, he will be remembered by many old manufacturers of hosiery and in connection with the manufacture of spring needles used in knitting these goods. Mr. Sands was, during his long business career, engaged in many enterprises in New Hampshire, Massachusetts and Vermont, and has, perhaps, taken out as many patents as any one man in New England. Starting in life a poor boy and with a limited education, he, after many reverses, succeeded in acquiring a very comfortable property, on which he retired some ten years ago. Mr. Sands was born at St. Albans, Maine, July 4, 1833. His early boyhood was spent at Forth Smith, Ark., during the construction of that fort by his father, Hiram Sands. At the age of 14 years he was apprenticed to the Davenport & Kirk Locomotive Company. He soon developed mechanical genius and invented several useful articles, among which was the Sands brick making machine, the patent for which he sold for what was considered in those days a large sum of money. Following this he was an employee of the Singer Sewing Machine Company. Later he invented a pipe organ. Mr. Sands' next invention and business venture of note was a spring needle, for making knit goods and he established the Sands Spring Needle Company, at Laconia, N. H. During his connection with this company he devoted a large share of his time to visiting the hosiery manufacturers throughout the country, in the interest of his company. He also became engaged in the manufacture of hosiery. About 1870 Mr. Sands became interested in ice cream freezers, and invented what is now known as the White Mountain freezer. This led to the establishment of the White Mountain Freezer Company. In 1881 the works were burned, and he re-established them at Nashua, N. H., managing the same until about 1890, when he sold out and retired from the business. While engaged in putting this venture on a solid footing, he not only gave the details of manufacturing his personal attention, but devoted much time to traveling in the interest of his freezer, and for years "Tom" Sands was a familiar figure to the buyers of many concerns throughout the country. He became interested and helped to establish the Blanchard Churn Factory, serving that company in the capacity of president. He was also instrumental in giving Nashua the Sands & Brown Mfg. Company. Mr. Sands has served the city of Nashua as Mayor, was president of the Sons and Daughters of Maine, was a York Rite and Scottish Rite Mason, a prominent Odd Fellow and a Knight of Pythias. He had been falling in health for several years, but never lost hope, and to the last was planning new enterprises which he would engage in when he recovered his health. His funeral was held under the auspices of St. George Commandery, K. T., in the Unitarian Church, at Nashua, on the 21st ult., and was largely attended by friends, relatives and business associates.

A. DE MARCE.

A. De Marce, proprietor of the Texas Steam Engineering & Foundry Works, Texarkana, Texas, died on April 21, after a prolonged illness, at the age of 71 years.

ELI I. MERRIMAN.

Eli I. Merriman, secretary and treasurer of the Meriden Malleable Iron Company, died on April 22 at Meriden, Conn., from congestion of the brain, aged 63 years.

CHARLES A. FRUNCK.

Charles A. Frunck, chief chemist and manager of the blast furnace of the National Steel Company, at Sharon, Pa., was killed by a train at New Brighton, Pa., on April 19. Mr. Frunck was only 28 years of age.

PETER M'FARLANE.

Peter McFarlane, head of the firm of McFarlane, Thompson & Anderson, Frederickton, N. B., died recently in his fifty-fifth year. After some years with the firm of Peter McFarlane & Sons, foundrymen of Nashua, N. B., he went to Frederickton in 1870 and started the New Brunswick Foundry, now operated by the firm of McFarlane, Thompson & Anderson.

Heavy rains in the Southwest are reported to have inflicted serious damage on the growing cotton, which may result in a sharp falling off in the total yield.

New East River Bridge.

Specifications for Steel and Masonry Approaches.

The commissioners of the new East River Bridge, New York City, will receive bids on May 31 for the construction of the steel and masonry approaches on the Brooklyn and Manhattan sides of the structure. About 18,000 tons of steel will be required. The contractor for the Manhattan approach will be obliged to furnish bonds in the sum of \$400,000, the bonds for the Brooklyn approach being in the sum of \$200,000. The Manhattan approach will be about 2000 feet in length, the Brooklyn being about 1700 feet. The structure carries two tracks for elevated railroad, two foot walks, two bicycle paths, four trolley tracks and two roadways.

The specifications before us cover the foundations, masonry work and steel. All steel must be made in an open hearth furnace lined with silica, the stock from which it is made consisting entirely of pig iron, or of pig iron and acid open hearth scrap. When scrap is used it must not exceed 25 per cent. of the furnace charge. No portion of the stock must contain more than 0.10 per cent. of phosphorus, or more than 0.05 per cent. of sulphur. During the reduction of steel in the open hearth furnace it must not be decarbonized below 0.10 of 1 per cent. The recarbonization of steel and addition of manganese must be accomplished by the use of ferromanganese or spiegeleisen only, and must be performed in a careful manner most likely to give uniform results. The elastic limit must not be less than one-half of the ultimate strength. The finished steel must be made into bottom cast ingots weighing not more than 5000 pounds each, and cast in groups of not less than six ingots to each group.

The finished steel must not contain more than the following proportions of the elements named:

	Per cent.
Phosphorus	0.07 of 1
Sulphur	0.04 of 1
Manganese	0.50 of 1
Silicon	0.10 of 1
Copper	0.02 of 1

Specimens cut from the finished material must have the following physical properties:

Description of material.	Strength in pounds per square inch.	Elongation. Per cent. in 8 inches.	Reduction. Per cent. of area.
Shapes and universal mill plates 60,000 to 68,000	22	44	
Sheared plates..... 60,000 to 68,000	20	44	
Rivet Rods..... 54,000 to 60,000	25	50	

Steel for castings must be made in an open hearth furnace lined with silica, at least one-third of all the stock used being pig iron.

The finished steel castings must not contain to exceed the following limits of the elements named:

	Per cent.
Phosphorus.....	0.06
Sulphur.....	0.04
Manganese.....	0.50
Silicon.....	0.35

All steel castings shall be carefully and thoroughly annealed.

All plates and angles to be riveted which do not exceed $\frac{3}{4}$ inch in thickness must be punched $\frac{1}{4}$ inch less than the rivets used, and after being straightened must be assembled and reamed to the proper size to admit the rivets. Those thicker than $\frac{3}{4}$ inch must be assembled and drilled to the proper size to admit the rivets without punching. Wherever practicable the rivets must be machine driven, both in the shop and in the field.

The structure must be finished within 15 months after the execution of the contract.

PERSONAL.

Harry A. Marlin of Marlin & Co., Incorporated, makers of galvanized iron cornices, at Pittsburgh, has been made a member of the Pittsburgh Stock Exchange.

B. F. Jones of Pittsburgh, Pa., and his wife, will celebrate their golden wedding on May 21. Mr. Jones is head of the firm of Jones & Laughlins, Limited, and president of the American Iron & Steel Association.

Henry G. Morse, president of the New York Shipbuilding Company, who are erecting a large plant at Camden, N. J., has gone to Europe on a business trip.

Andrew Carnegie will sail for Scotland on Tuesday, May 7. Mr. Carnegie will not visit Pittsburgh previous to his departure abroad.

W. N. Sawyer has resigned his position as general superintendent of the Alabama Steel & Shipbuilding Company's plant at Ensley, Ala.

Oliver Phelps of Detroit, Mich., has been appointed general manager of the Lorain Foundry Company, Lor-

ain, Ohio. Mr. Phelps was formerly connected with the Michigan-Penninsular Car Company.

Charles M. Schwab, president of the Carnegie Company, sailed for England last week on a short business trip.

Cement Construction.

Two extremely interesting publications relating to cement construction have recently been received. One of these is the prospectus of the Great Northern Portland Cement Company, 82 and 84 Griswold street, Detroit, Mich., and the other is a pamphlet relating to a French process of cement construction, issued by the American representative. Both of them are of value to engineers and all others connected with or interested in the construction of not only buildings, but of a great variety of work to which cement is applicable, either in mass or in connection with iron and steel.

The prospectus of the Great Northern Portland Cement Company treats primarily of the plans of that company, incorporated with a capital stock of \$5,000,000. It is their purpose to establish a large plant at Baldwin, Mich., a railroad junction, 30 miles east of Ludington, where the company have 6000 acres of land, much of which is underlaid by marl and clay suitable for the manufacture of Portland cement of high quality. The president of this company is George Anderson, Detroit; first vice-president, Charles A. Strelinger, Detroit; second vice-president, Burton W. Yates, Detroit; treasurer, David Ogilvie, Detroit; secretary, Charles B. Parsons, Detroit; auditor, Arthur E. Barley, Detroit; directors, George Anderson, Charles A. Strelinger, David Ogilvie and Lemuel H. Foster, all of Detroit; William Fillingham of East Orange, N. J.; C. Frederick Smith and Frederick W. Garvin of New York, and Burton W. Yates and Charles B. Parsons of Detroit; consulting engineer, R. C. Carpenter, professor of experimental engineering, Cornell University, Ithaca, N. Y.

Apart from the presentation of the purposes of the company the prospectus issued is a fine treatise on the uses of cement in all kinds of construction. Illustrations are presented of buildings in which cement is used either wholly or very largely. Interesting applications of cement are also illustrated, as, for instance, the veneering of frame houses with cement, attached by means of expanded metal or heavy wire netting as a connecting medium. The compilers of the data given in this publication have spared no pains and gone to much expense in collecting the information, and also in presenting it in such attractive form.

The other publication to which reference is made is a little volume entitled "Monier Constructions," issued by the Central Technical Bureau, E. Lee Heidenreich, sole representative for the United States, 541 to 545 Rookery Building, Chicago. This work sets forth the special features of a system invented by P. A. J. Monier of Paris, who applied it in the construction of water basins, cisterns, &c. Within the last ten years the Monier constructions have found applications in nearly all branches of engineering, civil and important military constructions, house building, highway and railroad bridge construction, hydraulic mining, shipbuilding, fortifications and in sanitary construction. The development has until quite recently been almost entirely in Europe, but a beginning is now being made in this country. The Monier construction consists of two materials—namely, rod iron or steel and cement. The iron or steel is either in the form of rods or wires used as carrying rods and distributing rods. These rods are applied like netting, with meshes varying according to the requirements of the construction, and when placed form a skeleton to which the cement is applied. The method of construction is quite comprehensively set forth in the publication referred to, and great ingenuity is displayed in adapting it to a great variety of purposes. Among the uses shown are bridges, fire proof flooring, water pipe, sewer pipe, large grain storage houses and elevators, large water tanks, great conduits, &c. A special use to which this system is adapted is in protecting steel bridges and viaducts from oxidation or corrosion. The Monier construction is less expensive than covering with tile, as done in some cases, and is certainly much more durable than covering with wood, as is frequently done.

Some of the leading colleges are to be honored in the naming of the six large steel vessels that are being built by the American Ship Building Company, at Cleveland, Ohio, for the Pittsburgh Steamship Company, controlling the ore fleet of the Carnegie Steel Company. The first of these vessels, a steamer to be launched about May 5, will be named "Harvard." Then will follow the "Lafayette," "Princeton," "Cornell" and very probably "Columbia," for the other four steamers to be finished in the summer and latter part of the year. One steel tow barge in the new fleet will be named "Bryn Mawr."

MANUFACTURING.

Iron and Steel.

The Carnegie Steel Company have received a contract for furnishing the structural material for the new office building of the Pittsburgh Bank for Savings, to be erected at Smithfield street and Fourth avenue, Pittsburgh, Pa. The contract calls for about 2000 tons.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers will commence at Indianapolis, Ind., on May 15, and the Wage Committee has been called to meet in Pittsburgh on May 10, for the purpose of preparing a report of the convention. Many members of the association are dissatisfied with the present rate of wages, and want the base rate changed from bar iron to some other commodity. One of the subjects which will be considered is to ask a shut down of all the mills during July and August. It is hoped that by doing this better wage scales can be secured, as it will make a reduction of close to 20 per cent. in output.

The Illinois Steel Company have ordered 22 gas producers, provided with the Bildt automatic feed device, from the Morgan Construction Company of Worcester, Mass. These producers will be installed at South Chicago, Ill.

The Central Steel Company of Indianapolis, Ind., are arranging to engage in the manufacture of merchant bar steel. An 18-inch bar mill and a 10-inch Belgian train will be added, and all sizes of bar steel from 1/4-inch to 4 inches rounds and squares and from 1/2-inch to 6-inch flats will be turned out. The daily capacity will be about 150 tons. The company also contemplate adding a sheet mill.

In the United States Circuit Court, at Pittsburgh, the Shelby Steel Tube Company have entered suit against the Standard Seamless Tube Company for an alleged infringement of a patent for enlarging metallic tubes.

At the Brown-Bonnell Works, the Valley Works and the Andrews Works of the Republic Iron & Steel Company, all located at Youngstown, Ohio, only a few departments of each plant were in operation last week. The company are taking advantage of the present slack demand to make repairs at their different works.

The two Youngstown mills of the American Steel Hoop Company are being operated to nearly full capacity.

Machinery.

The Standard Automatic Gas Engine Company of Oil City, Pa., are desirous of securing larger facilities, and have about decided to erect a plant at Youngstown, Ohio. A site has been selected and bids have been asked for on the erection of a shop building 80 x 200 feet, 80 x 300 feet or 80 x 400 feet, bids having been asked for each; the material to be either brick, wood or structural steel with tiling. Upon the cost of the building proposed will depend the change mentioned. The company manufacture engines for all purposes except reversible hoisting engines, and make a specialty of engines for street railway, electric light and power plants, air compression, refrigerating plants, &c.

T. P. Kinman, assistant mechanical superintendent of the Standard Pneumatic Tool Company, Chicago, has sailed for Paris, in order to install and operate the company's Little Giant pneumatic tools and appliances at the Paris Exposition. They will have a complete air plant in actual operation in the Champ de Mars and Park Vincennes, demonstrating the adaptability of this class of machinery. It will be a novel and interesting exhibit and one that will redound to the credit of America.

The New York branch of the Warner Elevator Mfg. Company, Cincinnati, Ohio, is reported as having done an extensive business, especially in the line of electric elevators, in which the Cincinnati concern were the pioneers. At present there are under construction no less than 10 carloads of elevators for use in New York City.

The Cutler-Hammer Mfg. Company, Milwaukee, Wis., have just completed a three-story addition to their building, 50 x 75 feet, and now have a factory building with 43,000 square feet, the whole of which is devoted exclusively to the manufacture of rheostats.

The 300 horse-power generator built by the Bullock Electric Mfg. Company of Cincinnati, Ohio, for the Vincennes annex of the Paris Exposition, and which was lost with much other machinery from Cincinnati by the sinking of the "Pauline," has been duplicated, the second having been shipped on April 25. As the generator in question was designed to furnish the power with which to drive the machinery in the annex, its loss caused considerable delay to the exposition management. The rapidity with which the company are prepared to turn out work of this class is exemplified in the fact that within 27 days from receiving notice from the French Government to duplicate the generator it was ready for shipment and is now on its way to France. The casting alone weighed 36,000 pounds.

The Northern Engineering Works, crane builders, Detroit, Mich., have found it necessary on account of their increased electric crane business to remodel a portion of the building formerly used as a foundry, and turn it into an erecting shop, giving them 50 x 150 feet additional erecting space. They report an increasing demand for their product.

A dispatch from Portland, Ore., reports that the Wolf & Zwicker Iron Works of that city will erect a shipbuilding plant and machine shop, costing \$250,000, at St. John's, Ore.

The York Mfg. Company of York, Pa., manufacturers of ice making and refrigerating machinery, report the following recent orders for their products: A 10-ton refrigerating plant for a brewery at Haverstraw, N. Y.; a 25-ton ice making plant for the People's Ice Company at Montgomery, Ala.; a 15-ton refrigerating and a 7-ton ice plant for the Waynesburg, Pa., Ice & Cold Storage Company; refrigerating machinery for the Old Port Jervis Brewery, at Port Jervis, N. Y.; a 150-ton refrigerating plant for the Worcester Brewing Corporation, at Worcester, Mass.; a 25-ton refrigerating plant for the Garden City Brewing Company, Missoula, Mont.; a 25-ton ice making plant for the Hamlet Ice Company, at Hamlet, N. C.; a 25-ton ice making plant for the Raleigh Ice Company, Raleigh, N. C.; a 40-ton ice making plant for a new ice making company of Washington, D. C. The A. A. Jewett & Co. of Philadelphia, are having installed in their ice making and refrigerating plant a 200-ton ammonia condensing system, the work in connection with which is being done by the York Mfg. Company.

The Marlon Machine & Tool Company have been incorporated in Indiana, with a capital of \$25,000, by L. C. Cole, Robert J. Main and John M. Main.

The incorporation in Delaware is announced of the Montgomery-Robertson Mfg. Company, with a capital stock of \$250,000, by Chicago and Philadelphia incorporators. The stated purpose of the company is to manufacture roller-bearing axles and all kinds of machinery.

Plans have recently been accepted by the United Traction Company of Rhode Island for a new machine and repair shop to be erected just outside the limits of the city of Providence, on a site between the old Stonington and New England roads. The building will have a frontage of 400 feet and will cover an area of nearly 3 acres. It will be of brick and steel, with granite trimmings. The estimated cost is \$250,000. The shop will be used for the purpose of repairing the electric cars of the Union Railroad Company, the Rhode Island Suburban Railroad Company and the Pawtucket Street Railway Company, and 500 men will be employed. Much of the steel to be used in construction is already on the ground, and work will be begun at once on the proposed building.

The Smith & Kilby Company, Anniston, Ala., whose foundry was entirely destroyed by fire on December 27, have just finished a new building, replacing the old, added a boiler shop and built an extension to their machine shop. They manufacture machine castings, frogs, switches and boilers, and make a specialty of rebuilding light locomotives.

Armor Plate Steel for Locomotives.—The Pittsburgh Locomotive Works are building two locomotives for the Pittsburgh, Bessemer & Lake Erie Railway, the frames for which are being constructed of armor plate steel furnished by the Carnegie Steel Company. These locomotives are to be the largest that can be constructed for operation upon a standard gauge line. The boilers are to be 86 inches in diameter at the smallest ring, are to be constructed of 1-inch steel, and are to carry a working pressure of 225 pounds per square inch. One of these locomotives is to be sent to France for the Exposition.

Two additional sub-contracts have been awarded by the Executive Committee of the New York Rapid Transit Subway Construction Company. The successful bidders were Hayes Bros. of Jonesville, Wis., and the Terry & Tench Construction Company of New York. The first named contractor will build the subway between Eighty-second and 104th streets. The contract with the Terry & Tench Construction Company calls for the erection and assembling of all the steel to be used on the viaduct section of the road between 125th and 133d streets on the main line, between Hillside avenue and Kingsbridge road on the West Side, and between 149th street and Bronx Park on the East Side line. There will be three passenger stations included in the section which will be built by Hayes Bros. Mr. Tench stated yesterday that the Carnegie Company would furnish all the parts and that his company would do the work by pneumatic riveting.

The New York By-Product Coke Company, incorporated yesterday at Albany, with a capital of \$6,000,000, have acquired the exclusive right to operate the Otto-Hoffmann coke ovens within a radius of 60 miles around New York City, and will install a plant as soon as a suitable site, not yet selected, has been secured.

A dispatch states that the Taylor Iron & Steel Company of High Bridge, N. J., are filling a large contract for steel wheels to be used on the sugar plantations in the Sandwich Islands. They will be shipped around Cape Horn to San Francisco and consigned to the Hawaiian Commercial & Sugar Company, Kahalui, Hawaii.

The Iron and Metal Trades.

A notable event of the past week was the capture by the Phoenix Bridge Company of the contract for the great bridge over the St. Lawrence River, Canada, which will require 27,000 tons of Steel. This is one of the largest bridge contracts ever placed. Proposals are now being invited on the approaches to the new East River Bridge, New York, which will take about 18,000 tons of Steel. The bids will be opened on the 31st inst. In connection with these important matters the fact may be noted that heavy quantities of Pig Iron for export are under negotiation. It is asserted that possibly 100,000 tons may shortly be covered for foreign shipment as a result of the negotiations now under way. Sales of Finished products have also been made for export to a considerable extent during the week. Prices are now approaching a level which is offering opportunities for the renewal of export business on dimensions which make the movement appear considerable.

The situation of the domestic market generally is a little less favorable than last week. Prices are yielding under the strain of the recent unfavorable developments, and a lower range of values seems to be assured. Our reports from various trade centers show that reductions have been made in various rolled products. Rails, Structural Shapes and Sheets are notable exceptions. The reductions made have not been large, but serve to show the tendency now existing. Buyers are disposed to hold off, not being inclined to make purchases of any considerable quantities so long as they believe that by waiting they may be able to do a little better for themselves. How long they may be inclined to wait is a question that every one would like to be able to solve, but at present it would seem that the country must work off stocks of manufactured goods and get down to almost bare shelves before a general buying movement sets in. Meanwhile every effort is being made by large manufacturers to keep the situation steady and prevent demoralization. It is rather remarkable considering the circumstances that manufacturers are preserving their equanimity.

The epidemic of strikes now prevalent throughout the country is not calculated to be reassuring, and this situation must certainly clear up before much improvement can be expected. The disposition of workmen to strike appears to be a necessary accompaniment of the period of high prices and excessive demand for labor through which we have recently been passing. Possibly the quietness in the Iron trade and the closing of a considerable number of Iron establishments, throwing many men out of employment, may tend to sober the judgment of the labor leaders who are responsible for these disturbances.

The report is in circulation, as we go to press, that the promoters of the American Bridge Company are in session in this city, and that the consolidation of the leading bridge companies of the country is likely to be accomplished this week.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

	May 2, 1900.	Apr. 25, 1900.	Apr. 4, 1900.	May 3, 1899.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$21.50	\$21.75	\$21.75	\$15.75
Foundry Pig, No. 2, Southern, Cincinnati.....	19.75	20.00	20.25	14.50
Foundry Pig, No. 2, Local, Chicago.....	22.50	23.00	23.50	15.00
Bessemer Pig, Pittsburgh.....	nom	24.50	24.90	16.00
Gray Forge, Pittsburgh.....	30.00	20.00	21.00	14.50
Lake Superior Charcoal, Chicago.....	25.50	25.50	25.50	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh.....	30.00	31.00	33.00	26.00
Steel Billets, Philadelphia.....	nom	nom	35.00	27.50
Steel Billets, Chicago.....	nom	nom	nom	25.50
Wire Rods, Pittsburgh.....	48.00	nom	nom	32.00
Steel Rails, Heavy, Eastern Mill.....	35.00	35.00	35.00	25.00
Spikes, Tidewater.....	2.50	2.60	2.60	1.70
Splice Bars, Tidewater.....	2.20	2.20	2.20	1.40
OLD MATERIAL:				
O. Steel Rails, Chicago.....	17.50	17.50	18.00	11.50
O. Steel Rails, Philadelphia.....	21.50	22.00	23.50	14.00
O. Iron Rails, Chicago.....	21.00	21.00	22.00	18.00
O. Iron Rails, Philadelphia.....	23.00	24.00	24.00	18.00
O. Car Wheels, Chicago.....	24.00	24.00	24.00	15.50
O. Car Wheels, Philadelphia.....	22.00	23.00	23.00	15.50
Heavy Steel Scrap, Chicago.....	16.00	16.00	17.00	10.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia.....	1.85	2.00	2.10	1.55
Common Iron Bars, Youngstown.....	1.90	2.00	2.15	1.55
Steel Bars, Tidewater.....	2.10	2.15	2.40	1.75
Steel Bars, Pittsburgh.....	1.95	2.00	2.25	1.65
Tank Plates, Tidewater.....	1.85	2.00	2.05	2.20
Tank Plates, Pittsburgh.....	1.75	1.80	1.90	2.10
Beams, Tidewater.....	2.40	2.40	2.40	1.61
Beams, Pittsburgh.....	2.25	2.25	2.25	1.50
Angles, Tidewater.....	2.40	2.40	2.40	1.65
Angles, Pittsburgh.....	2.25	2.25	2.25	1.50
Skelp, Grooved Iron, Pittsburgh.....	1.85	1.90	1.97 1/2	1.75
Skelp, Sheared Iron, Pittsburgh.....	1.80	1.90	2.10	1.90
Sheets, No. 27, Chicago.....	3.35	3.35	nom	...
Sheets, No. 27, Pittsburgh.....	3.15	3.15	3.15	2.75
Barb Wire, f.o.b. Pittsburgh.....	2.80	2.80	3.80	2.70
Wire Nails, f.o.b. Pittsburgh.....	2.80	2.20	3.20	2.10
Cut Nails, Mill.....	3.05	2.50	2.50	1.65
METALS:				
Copper, New York.....	17.00	17.00	17.00	19.25
Spelter, St. Louis.....	4.45	4.50	4.40	6.70
Lead, New York.....	4.70	4.70	4.70	4.57 1/2
Lead, St. Louis.....	4.55	4.55	4.57 1/2	4.30
Tin, New York.....	30.00	30.00	31.75	25.85
Antimony, Haint, New York.....	9.75	9.75	9.75	10.00
Nickel, New York.....	42.00	42.00	38.00	38.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York.....	4.84	4.84	4.84	4.05

Chicago. By Telegraph.)

Office of The Iron Age, 805 Fisher Building,
Chicago, May 2, 1900.

Markets continue in a more or less chaotic condition by reason of the Wire reduction two weeks ago. In various lines of product there are a few buyers who are looking for a break of \$20 per ton, and who will apparently be satisfied with nothing short of that. It follows that at present prices they are not buying. It is generally recognized that the element of time must enter into the settlement of the market, and that for a little while the trade generally will watch and wait. Buyers are interested, however, and inquiries of all sorts are common. A repetition of previous prices will not lead to purchases, and a reduction, no matter how great, will at present be equally inefficient in bringing forth the order for future deliveries. Accordingly in many instances sellers are either refraining from quotations, or are suggesting to their customers a suspension of negotiations until things settle down to some basis of comparative firmness. Everything points to heavy demands just as soon as the proper time arrives for making purchases. An occasional buyer flies in the face of the inactivity and closes for his needs. There is steady consumption for all kinds of products. The course of values is slightly downward.

Pig Iron.—Newspaper reports from the East announcing a break in Pig Iron prices have added to the disinclination of melters to close contracts. These reports find no corroboration in trade circles, but when the prospective purchaser sounds the market and finds values practically where they had been, he is not persuaded to buy and retires without engaging his material. All the principal sellers of Pig Iron in this market say there is continued scarcity of high grade Iron for nearby shipments, and that on old contracts buyers are continually urging speedier shipments. Makers are behind in their orders, and in so far as supply and demand go the situation has not changed materially. The backwardness of buyers is tending to throw into a comparatively narrow period of time, this month or next, some very large buying for the last half of the year. Meanwhile producers are keeping an eye on the foreign mar-

kets. A reduction of \$2 or \$3 would put even Chicago Iron on an exporting basis, at present prices aboard, and that kind of a movement from the West is therefore not wholly improbable. The heavy buying at St. Louis a week or two ago took 10,000 to 15,000 tons of Lake Superior Charcoal Iron from this district. Since then transactions have been few that were larger than several hundred tons each. We quote for cash as follows:

Lake Superior Charcoal.....	\$25.50 to \$26.00
Local Coke Foundry, No. 1.....	23.00 to 23.50
Local Coke Foundry, No. 2.....	22.50 to 23.00
Local Coke Foundry, No. 3.....	22.00 to 22.50
Local Scotch, No. 1.....	23.00 to 23.50
Ohio Strong Softeners, No. 1.....	24.00 to 24.50
Southern Silvery, according to Silicon.....	25.50 to 27.00
Southern Coke, No. 1.....	22.35 to 22.85
Southern Coke, No. 2.....	21.35 to 22.85
Southern Coke, No. 3.....	20.35 to 20.85
Southern Coke, No. 1 Soft.....	22.35 to 22.85
Southern Coke, No. 2 Soft.....	21.35 to 22.35
Foundry Forge.....	20.85 to
Gray Forge and Mottled.....	20.85 to
Southern Charcoal Softeners, according to Silicon.....	21.85 to 25.85
Alabama and Georgia Car Wheel.....	24.85 to 25.85
Malleable Bessemer.....	24.00 to
Standard Bessemer.....	..... to
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	30.00 to 31.00

Bars.—Specifications for Bar Iron and Steel this week show improvement. The movement is better than for many weeks, and is back almost to the average tonnage of last year, but there is no departure from the prevalent policy of ordering for only present needs. Many buyers want the lowest prices current, but are not averse to a high level, for their own profits are best when values are up, but the agricultural implement people and manufacturers who sell directly to the farmers are more concerned about the prices of their own product. Small producers are slightly shading values, but prices remain nominally without change at 2.07c. for Common Iron, and 2.10c. for Steel. From store quotations remain at 2.25c. to 2.50c. for Iron and Steel, and 2.65c. for Hoops and Bands.

Structural Material.—The flurry in other products has attracted the attention of Structural Material buyers to the market and inquiries recently have multiplied. There is a large volume of business in sight, and a fair amount has been closed within the past few days. Prices are unchanged. Mill shipments are quoted as follows, Chicago delivery: Beams, Channels and Zees, 15-inch and under, and Angles, 3 to 6 inches, 2.40c.; Beams, &c., 18 inches and over, and Angles over 6 inches and under 3 inches, 2.50c.; Tees, 2.45c.; Universal Plates, 2.10c. to 2.20c. From local yards small lots of Beams and Channels are quoted at 2.90c. to 3c.; Angles, 2.65c. to 2.70c. rates, and Tees, 2.75c. to 2.85c.

Plates.—Values are on about the same basis as a week ago, but trading is confined mainly to small lots for early shipments. Consumption does not suffer, but users are limiting purchases to the bare necessities. Quotations on mill shipments, Chicago delivery, are as follows: Tank, 2.05c. to 2.15c.; Flange, 2.30c. to 2.40c.; Marine, 2.75c. to 2.90c.; Fire Box, 3.25c. to 5c. Jobbers quote Tank from store, 2.30c. to 2.40c., and Flange, 2.50c. to 2.75c.

Merchant Pipe.—Business is light, some sellers pronouncing trade dull. Quotations are nominally unchanged. Standard quotations on less than carloads are as follows:

Sizes.	Black	Galvanized.
$\frac{1}{2}$ to $\frac{3}{4}$ inch.....	25 and 2 $\frac{1}{2}$	10
$\frac{1}{2}$ inch.....	25, 10, 10, 2 $\frac{1}{2}$	20 and 5
$\frac{3}{4}$ inch.....	25, three 10s, 7 $\frac{1}{2}$	20, 10 and 5
1 to 4 inches.....	25 and four 10s	20, 10, 7 $\frac{1}{2}$
4 $\frac{1}{2}$ to 12 inches.....	25, three 10s, 2 $\frac{1}{2}$	20, 10, 2 $\frac{1}{2}$
1 to 4 inches, R. & P.....	25, three 10s and 5	20, 10, 2 $\frac{1}{2}$

Carload lots take 5 per cent. additional discount on these prices.

Sheets.—The new schedule of prices by the American Sheet Steel Company has not yet been announced, but is looked for in a few days. Meanwhile quite a little irregularity exists, due to the closing out of various stocks by sellers who expect to retire from that branch of business. The trade seems to be able to absorb quite a tonnage, and at the attractive prices named transactions have been large. The present tendency of values is toward greater firmness, and conservative sellers report a full share of orders. From store No. 27 is quoted at 3.55c., though that price has been shaded. Galvanized has ranged from 70 to 70 and 5 per cent. from store, and from 70 and 5 to 70 and 7 $\frac{1}{2}$ per cent. from mill.

Merchant Steel.—There is an easier feeling in this as in most other departments of trade. While consuming

the usual amount of material buyers are conducting their new negotiations for material with caution. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Tire, 2.60c. to 2.80c.; Open Hearth Spring Steel, 3c. to 3.25c.; Toe Calk, 3c. to 3.25c.; Sleigh Shoe, 2.50c. to 2.75c.; Cutter Shoes, 3.45c. to 3.65c.; Ordinary Tool Steel, 7c. to 7 $\frac{1}{2}$ c.; Special, 13c. and upward.

Rails and Track Supplies.—New inquiries are in the market for from 5000 to 10,000 tons of Standard Sections, and fair sized lots have been closed. Deliveries continue an important factor to trade, and the makers who can ship earliest are taking most of the current orders. Prices continue very firm. Prices are as follows: Steel Fish Plates, 2c. to 2.25c.; Iron Fish Plates, 2.25c.; Spikes, 2.50c. to 2.60c.; Track Bolts, with Hexagon Nuts, 3.80c. to 3.90c.; Square Nuts, 3.65c. to 3.75c.; Steel Links and Pins, 3c.; Iron Links and Pins, 3c.

Old Material.—Extreme caution has taken possession of the trade. What would have been very enticing figures a few weeks ago are now passed by dealers and consumers. There is reported an area of heaviness in territory east of Chicago relatively more pronounced than in the West. In the absence of large transactions prices are more than usually nominal. Approximate quotations are as follows, per gross ton:

Old Iron Rails.....	\$21.00 to \$22.00
Old Steel Rails, mixed lengths.....	17.50 to 18.00
Old Steel Rails, long lengths.....	19.00 to 20.00
Relaying Rails.....	28.00 to 30.00
Old Car Wheels.....	24.00 to 24.50
Heavy Melting Steel Scrap.....	16.00 to 17.00
Mixed Steel.....	12.50 to 13.00
Iron Fish Plates and Angle Bars.....	21.00 to 22.00
Steel or Mixed Iron and Steel ditto.....	17.00 to 18.00
Iron Car Axles.....	25.00 to 26.00
Steel Car Axles.....	23.00 to 24.00
No. 1 Railroad Wrought.....	21.50 to 22.00
No. 2 Railroad Wrought.....	17.50 to 18.00
Shafting, Iron and Soft Steel.....	18.00 to 19.00
No. 1 Wrought.....	15.50 to 16.00
No. 1 Country Wrought.....	14.00 to 14.50
No. 1 Mill.....	11.00 to 11.50
No. 2 Mill.....	7.50 to 8.00
No. 1 Busheling.....	13.00 to 13.50
No. 2 Busheling.....	9.50 to 10.00
Iron Car Axle Turnings.....	13.50 to 14.00
Soft Steel Car Axle Turnings.....	12.50 to 13.00
Machine Shop Turnings.....	11.50 to 12.00
Wrought Drillings.....	11.00 to 11.50
Cast Borings and Drillings.....	8.00 to 8.50
Mixed Borings and Turnings.....	8.00 to 8.50
No. 1 Boilers, cut.....	12.00 to 12.50
No. 2 Boilers, cut.....	6.00 to 6.50
Boiler and Ship Scrap.....	14.00 to 14.50
No. 1 Cast.....	13.00 to 13.50
No. 2 Cast.....	8.50 to 9.00
Railroad Malleable Cast.....	15.00 to 15.50
Agricultural Malleable Cast.....	13.50 to 14.00

Metals.—There is a fair activity in Copper, spot shipments continuing desirable to buyers. Prices are steady at 17 $\frac{1}{2}$ c. for Lake, and 17 $\frac{1}{4}$ c. for Casting. Lead is in continued retirement as regards local buying, with prices firm at 4.65c. for Desilverized, and 4.75c. for Corroding.

Philadelphia.

Office of The Iron Age, Forrest Building, {
PHILADELPHIA, Pa., May 1, 1900. }

A strict adherence to facts will compel us to reiterate the monotonous tone of the reports made during the past several months. There is one new feature, however, which may develop important results, and that is a renewal of the foreign demand. A considerable quantity of Pig Iron has been bought, and enough Finished Material to encourage the hope that more will be taken, which would give much needed relief to the Bar, Sheet and Skelp mills. The fact that a fair amount of business has been done in the lines mentioned, however, is raising fierce opposition in Europe. They are raising a great hue and cry about being swamped with American Iron, and although they were almost in despair two or three weeks ago in regard to not getting enough material to go on with, they now rush to the other extreme and talk of adopting measures for self protection. It is pretty clear that they will not take high priced Irons, but at current quotations, and under reasonable rates for ocean freights, it is almost certain that a good deal of business may be worked through, possibly not so much for Great Britain or Northern Europe, but to countries in which the carrying rates from our Atlantic ports ought to be about equal to those from European ports. Business of this kind is under negotiation, but at the moment direct ocean freights are opposed to it. In the local markets there is practically no change whatever. Business in all lines is being done at the same prices as last week, but orders are not large, as buyers are unwilling to abandon the policy which they have followed for

several months past—viz.: to carry as little stock as possible pending some new light on the situation. There is an impression, however, that bottom figures have been reached, and the chances of advance are believed to be stronger than those for a decline, although faith has not yet been supported by aggressive action.

Pig Iron.—The market is as dull and inanimate as it has been for weeks past. Buyers appear to have lost all active interest so far as doing business is concerned. When Iron is wanted they buy just as little as possible, and at the lowest figure possible, but hardly any price is low enough to induce a big purchase. This is not because there is any great expectation of materially lower prices, but there is an uncertainty in regard to the outcome which is quite inimical to active operations. A good deal of Iron is being delivered on old contracts, and that no doubt has its effect. During the great pressure for deliveries last year a good many who were entitled to Iron had to be turned down, but as there is no pressure of that kind now deliveries on old contracts are being completed, and as the prices are in most cases still less than those of to-day it has more or less of an adverse influence on new deals. That is to say, a good deal of the Iron now coming in on old contracts is at lower prices than it could be bought for to-day, hence to-day's rates look high by comparison. It has been expected that the renewal of the export demand which has recently taken place would stimulate the home market, but so far everything seems to have fallen flat. There is no great pressure to sell beyond what is usual in a dull market. Stocks are light, and except for "off grades" the supply is extremely moderate, so that there is not the necessity which sometimes exists because of excessive supplies which must be unloaded on some terms. All the same there are more sellers than buyers, and if prices are equal to those ruling a week ago that is the best that can be said. Mill Irons are extremely dull, and there is little doubt that extremely low prices would be made if buyers could be found for good sized lots. In a general way sales have been at prices within the following limits, seaboard or equivalent points: No. 1 X Foundry, \$23 to \$23.50; No. 2 X Foundry, \$21.50 to \$22.25; No. 2 Plain, \$20.50 to \$21; Basic, \$21 to \$21.50; Bessemer, nominal, \$22 to \$22.50; Low Phosphorus, \$27 to \$28; Charcoal Iron, \$27 to \$29.

Billets.—There is nothing doing except in special Steels. Ordinary Steel would be done at \$34 to \$34.50, but there is no demand at present, consequently prices are more or less nominal, although it is believed that low figures would be quoted on desirable business.

Plates.—There is not much demand and competition is as keen as it has been at any time since the first of the year. Prices have been worked down to about 1.8c. at mill for Ordinary Tank Plates, but for anything with stringent requirements 1.9c. would be as low as could be done. A good deal of common material has been marketed at low prices, but there is a disposition to be more strict in specifications, hence there is more discrepancy in quotations than in ordinary times. General quotations for lots delivered at nearby points are about as follows: Steel Plates, 1/4-inch and thicker, 1.85c. to 1.90c.; Universals, 1.95c. to 2c.; Shell Plates, 2.10c. to 2.15c.; Flange, 2.30c. to 2.40c.; Charcoal Iron Plates, C. H. No. 1, 2.80c.; Best Flange, 3.30c.; Fire Box, 3.80c.

Structural Material.—Probably the largest order ever placed for a Steel bridge has been taken by the Phoenix Bridge Company. The structure is to cross the St. Lawrence River, connecting Point Levis with Quebec, and will require about 27,000 tons of material. Some of the material is being rolled already, but the bulk of the work will be done during the fall and winter months. The current demand for small lots is good, which with old contracts to complete gives ample employment, and will no doubt do so for months to come. Prices remain as follows: Beams and Channels, 15 inches and under, 2.40c.; Angles, 3 to 6 inches, 2.40c.; Zee Bars, 2.40c., f.o.b. Philadelphia; Angle Bulbs and Deck Beams, 2.68c.; Tees, 2.45c.

Bars.—There is very little change since last week. At low rates a very large business could be done, but manufacturers consider that 1.80c. to 1.85c. at mills is low enough for good Iron, although rumor says that as low as 1.75c. has been accepted. Some export business has been done, and mills have managed to run moderately full, but, as already stated, several very low quotations have been made. To-day 1.85c. to 1.95c. is named for Refined Iron, and 2.10c. to 2.15c. for Steel Bars.

Sheets.—There is a very good demand for Thin Sheets, and mills find it difficult to keep up with the demand. In the heavier grades an exceptionally dull market is reported, which, however, is believed to be only temporary. Prices are unchanged, as follows (Common Sheets two-tenths less): No. 10, 2.70c. to 2.80c.; No. 14, 2.95c.; No. 16, 3c.; Nos. 18-20, 3.05c.; Nos. 21-24, 3.15c.; Nos. 26, 27, 3.25c.; No. 28, 3.35c. to 3.45c.

Old Material.—The demand is very slow, and prices are easier all around. It is difficult to give exact figures as material that is not wanted at once is neglected, while for something needed immediately pretty fair prices have to be paid. Bids and offers for deliveries in buyers' yards, seaboard or nearby points: Choice Railroad Scrap, \$23 to \$24; No. 1 Yard Scrap, \$19 to \$20; No. 2 Light Scrap, \$14 to \$14.50; Machinery Cast, \$16 to \$16.50; Heavy Steel Scrap, \$20.50 to \$21; Old Iron Rails, \$23 to \$24; Old Steel Rails, \$21.50 to \$22; Wrought Turnings, \$14.75 to \$15.25; Cast Borings, \$12.25 to \$12.75; Old Car Wheels, \$22 to \$22.50; Iron Axles, \$25 to \$27; Steel Axles, \$26 to \$27.

Thomas W. Simperts has been appointed manager of the Philadelphia office of the American Sheet Steel Company. Mr. Simperts is also manager of the Philadelphia office of the American Steel Hoop Company and the National Steel Company (Aetna-Standard Works). The present office is 421 Chestnut street, but will be removed as soon as more convenient rooms can be secured.

Cleveland.

CLEVELAND, May 1, 1900.

Iron Ore.—The prediction made in this correspondence last week to the effect that the depression manifest in many lines of the Iron and Steel market would not be without influence upon the raw material situation has been more than justified. There has been an almost absolute suspension of sales of Ore, save perhaps a few minor transactions in special grades which are required for some particular use. The general sentiment among furnacemen would seem to justify the opinion that in the case of Bessemer Pig at least there will not be material reduction from prevailing prices, but at the same time the furnacemen are naturally just a trifle uncertain of their ability to maintain this stand. At any rate they are not disposed to close for any more Ore at present prices until something more is known of the conditions which may be expected in other lines. The transportation market also opened weak. Many things contributed to this. Of course the general business conditions tending toward lower values exerted some influence. Then the season of navigation opened some days earlier than had been anticipated, and it found shippers to some extent unprepared. Thus far they have had all they could do to take care of their contract vessels, and naturally the demand for "wild" tonnage has been curtailed proportionately. Finally, the bottom has dropped out of the grain market, and the factor of competition which it was expected would force up Ore rates to a fairly high figure has been entirely absent. Altogether it looks as if the owners of "wild" tonnage who held off and refused season charters at any price are likely to sustain a rude surprise. On the other hand, the shippers of Ore who have not fully covered the output which they have planned from the head of Lake Superior are correspondingly jubilant. They hold now that the market is certain to be rather in their favor than against them. After all the great surplus of uncontracted tonnage held by the Rockefeller interest constitutes the key to the situation. This interest may by holding on still force an era of exceptionally high "wild" rates, but it must be admitted that it looks improbable now. The Rockefeller people claim, however, that even if they are compelled ultimately to charter their vessels below the \$1.25 rate they will in the end be a gainer by their "corner" of the market. Ore shippers generally are not ready for outside tonnage, and up to date only a few small vessels have been placed at Escanaba, while the wild rates from the head of Lake Superior have not been fixed. Indeed, during the past few days some of the shippers have not been able to take care of their own boats and have been in the market for loads. The offerings of tonnage are not heavy, but vessels that are on the market will have trouble for some days to come in getting cargoes. A number of the Ore boats have also lost quite a little time since the opening, and will lose more, waiting for cargoes.

Pig Iron.—The period of universal dullness which was outlined as the stage of the market last week still continues, and it must be admitted that there are few indications to point to any break in the near future. The members of the Bessemer Furnacemen's Association seem to be a unit in the opinion that no concessions will be made in the price of that grade of material, and the comparatively small amount remaining to be disposed of would seem to justify this confidence. On the other hand, the foundrymen are not buying. No transactions of any magnitude are reported. If there was an inquiry for a large block of material there is no question but what some concessions could be had in the price of Foundry grades. After the first of the month, when some of the uncertain conditions affecting the labor market begin to clear up, it is quite possible that there will be some

improvement, but it will not be very marked until the present feeling of apprehension has passed away. The same percentage of Southern Iron continues to come into this market as for some time past.

Finished Material.—Although the market, generally speaking, is still somewhat slow, some of the sales agents report a noticeable improvement in inquiry and some improvement in the order mail during the past few days. The Plate market has perhaps strengthened somewhat, and the Sheet market is in fair condition. The market on Bars and some other grades still shows the effect of the recent bearish reports. The sales agents, while they all have instructions to get all the business possible, most of the mills being anxious for tonnage, have also been advised against any disastrous slashing of prices. The case is therefore rapidly resolving itself into a question as to whether the producer or consumer can hold out longest. There is no mistaking the confidence on each side. The sales agents argue that they know to a certainty that there is considerable business in the air, while the consumers are naturally influenced by the public statements made last week by several of the leading local capitalists who make a specialty of realty investments that they would absolutely suspend new building projects pending a lower scale of prices for material. Quotations in all lines continue practically without change.

Old Material.—The market is of course affected by the general waiting tendency, and in some cases a shading of prices has been the result. We quote: No. 1 Wrought, \$19.50; No. 1 Cast, \$15; Iron Rails, \$23.50; Car Wheels, \$20; Turnings, \$12.50; Borings, \$11.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, May 2, 1900.

(By Telegram.)

Pig Iron.—There is not enough being sold to establish a price. Some of the largest plants at which Bessemer Pig is used are closed and shipments have been stopped. If this condition should last any time stocks will accumulate pretty fast. There was practically no Bessemer sold in April, and in the absence of actual business it is impossible to quote. Buyers are holding off, believing that by doing so they will be able to buy at lower prices before long. If there was any business offering there is no doubt that material concessions in price would be made by the furnaces on the nominal price, which is \$24. The present price of Steel, which can be bought at \$30 a ton, does not permit of anything like \$24 a ton being paid for Bessemer Iron. Eastern furnaces are offering Iron considerably under \$23, Pittsburgh. There is an inquiry in the market from a Steel plant for considerable Bessemer Pig, and if the sale should be put through it will be the first transaction of any size for more than a month. Gray Forge is very quiet and local brands can be bought at \$20, Pittsburgh, and Eastern at about \$19.50. Foundry Iron is very dull and No. 2 local Iron could be bought on a firm offer at \$21.50, Pittsburgh. It is useless to give quotations on Pig Iron, as none is being sold on which to base prices.

Steel.—A sale is reported of a round lot of Rod Billets for May and June shipment at \$30, maker's mill. We quote Billets at \$30 to \$31, maker's mill. There is very little doing. The Youngstown and Columbus works of the National Steel Company are idle this week.

Sheet Bars.—There are very few buyers of Sheet Bars now, aside from the American Sheet Steel Company. The nominal price of Bars is \$36, but transactions between the large interests are at much lower prices.

(By Mail.)

So far as new tonnage is concerned very little is doing. The heavy cut in Wire and Nails made by the American Steel & Wire Company, and which has been followed by reductions in prices of Bars, Shafting, Plates, Chain and other forms of Finished Material, has scared buyers and they are afraid to place orders at prices which are much lower now than 30 days ago. Large consumers of both Raw and Finished Material have pretty well cleaned up stocks at low prices, and are simply refusing to buy, but are using up everything around their yards in the shape of Scrap, and when compelled to place orders for material, buy in the smallest quantities possible and for actual wants only. How

long the present unsettled condition in the Iron trade can exist no one can tell. It seems that the volume of business is not going to be satisfactory until prices have settled down to a point where buyers think it safe to take hold. Many in the trade believe it is a mistake to try to hold the Bessemer Iron market up to \$24, Valley, or close to that figure, when Steel and everything else has declined. It is not believed that any Pig Iron can be sold at \$24, or even close to that price, but there is not enough doing in Bessemer Iron to fix a price. In Finished Material tonnage is the lightest for many months, and prices are weak. The situation could hardly be more unsatisfactory, but the belief is still shared by many that it is only a matter of a short time until business will open up and tonnage improve. It would be well for those in the trade to largely discredit rumors in regard to prices that are being circulated at the present time. Reports of a decline of \$4 or \$5 a ton in price of Bessemer Pig Iron are to considerable extent untrue. It is a fact, however, that if any business were offering it could be placed at a much lower price than a month ago. Steel Billets seem to have settled down to about \$30 to \$31 at mill. In Finished Material, Shafting was reduced \$5 a ton and Chain was also reduced at meetings held last week.

Ferromanganese.—We continue to quote domestic Ferro at \$100, delivered at buyer's mill. In small lots of a few tons \$125 is quoted.

Structural Material.—Several very large jobs in the East are being figured on and may be closed before long. The tonnage in Structural Material being placed at the present time is not so large by any means as it was several months ago, but the mills are pretty well filled up on old contracts. Allegheny County is advertising for seven plate girder bridges and one pin connected truss, also two stone arch bridges, bids for which are to be in at noon on May 8. Considerable Steel tonnage is involved. Prices are unchanged, excepting Plates, which are lower. We quote Beams and Channels, 15-inch and under, 2.25c.; Beams and Channels, over 15-inch, 2.35c.; Angles, 1½ to 6 inches, inclusive, 2.25c.; Angles over 6 inches, 2.35c.; Zees, 2.25c.; Tees, 2.30c.; Bars, 2c.; Plates, ¼-inch and heavier, 1.80c. This price on Plates is being shaded.

Plates.—The Plate market is no better, either in demand or price, and 1.75c., Pittsburgh, on Sheared Plates, ¼-inch and heavier, has been shaded. It is reported that considerable tonnage of Plates to go into new boats being built at Cleveland has been placed, deliveries running over an extended period. The East River bridge work, referred to in this report some time since, has not been given out. We quote Sheared Plates, ¼-inch and heavier, at 1.75c. for good orders and 1.80c. in small lots; Shell, 1.90c.; Flange, 2c.; Marine, 2.10c.; Fire Box, 2.50c. to 3.25c. at mill. It is possible that on a very desirable order, and for large tonnage, our lower quotation on Sheared Plates would be shaded by some mills.

Sheets.—The Sheet market is quiet, but prices are fairly firm. Galvanized Sheets are perhaps a trifle lower. Buyers are placing orders only for small lots. We quote No. 27 Black Sheets at 3.15c. to 3.20c.; No. 28, 3.20c. to 3.25c. We quote Galvanized Sheets at 70 and 5 per cent., 15c. freight.

Bars.—The large producers of Steel Bars are, we are advised, trying to hold the market on Steel Bars at 2c., Pittsburgh, in carload lots, and are quoting this price on inquiries. However, some of the outside mills are shading it from \$1 to \$2 a ton. On Iron Bars the fixed price is 1.90c., Valley, but Eastern mills have sold Iron Bars at this price, or lower, delivered Pittsburgh. The tonnage in Bars being placed is very small, but the large producers believe that in a very short time the trade will place orders more freely.

Merchant Steel.—Trade is extremely dull and prices are lower. We quote: Open Hearth Spring Steel, 3.15c., base; Crucible, 4.40c. to 4.50c.; Bessemer Machinery, 2.25c. to 2.35c.; Open Hearth Machinery, 3c. to 3.10c.; Crucible, 4.25c. to 4.50c.; Hammered Lay Steel, 3.75c. to 4c.; Rolled Lay Steel, 3.25c. to 3.50c.; Plow Slabs, Bessemer, 2.25c. to 2.35c.; Open Hearth Steel, 2.50c. to 2.75c.; Tool Steel, 7c. and upward, on which 25c. freight allowance is made, all 30 days net cash, f.o.b. Pittsburgh.

Pipe.—Considering the generally unsettled condition of the Iron market, the demand for Pipe is reported by several of the leading mills to be fairly satisfactory. Tonnage in April showed some improvement over March. It is probable that for anything like a good order established discounts on Tubing would be shaded. Quotations by the mills to jobbers are unchanged, but, as stated above, are being shaded for desirable orders. Jobbers quote on Boiler Tubes, up to 22 feet, in small lots as follows: 1 to 1½ inch, Iron, 15 per cent.; Steel, 19½

per cent.; $1\frac{3}{4}$ to $2\frac{1}{4}$ inch, Iron, 21 per cent.; Steel, $24\frac{1}{2}$ per cent.; $2\frac{1}{2}$ to 8 inch, Iron, $43\frac{1}{2}$ per cent.; Steel, 46 per cent.; $2\frac{1}{2}$ and 9 to 13 inch, Iron, 32 per cent.; Steel, 36 per cent., all current list. On Screw and Socket Casing, Black, jobbers quote: 2-inch, random lengths, 18 per cent.; cut lengths, 10 per cent.; $2\frac{1}{4}$ to $2\frac{3}{4}$ inch, random lengths, 30 per cent.; cut lengths, 23 per cent.; 3 to $4\frac{1}{2}$ inch and $8\frac{1}{4}$ to $12\frac{1}{2}$ inch, 39 per cent., random lengths; 32 per cent., cut lengths; $4\frac{1}{4}$ to $7\frac{1}{4}$ inch, $46\frac{1}{2}$ per cent., random lengths; 41 per cent., cut lengths; $7\frac{1}{2}$ inch, all current list, $43\frac{1}{2}$ per cent.; cut lengths, 38 per cent.; Galvanized Casing, $1\frac{1}{4}$ c. per pound extra. In large lots lower prices than the above are quoted.

Skelp.—The Skelp market is very dull and prices merely nominal. We quote Grooved Iron and Steel Skelp at 1.85c. to 1.90c., and Sheared at 1.80c. to 1.85c. It is a fact that Sheared Skelp at the present time seems to be lower in price than Grooved.

Iron and Steel Scrap.—The Scrap market is very dull and prices are weak. Some lines of Scrap have gone off very sharply in the past week. To a large extent prices are merely nominal, owing to the fact that there is so little doing. We quote: Busheling Scrap, \$14, net ton; No. 1 Railroad Wrought Scrap, \$20, net ton; Cast Iron Borings, \$10.50, net ton; Turnings, \$12.25, net ton; Heavy Melting Stock, \$17, gross ton; Low Phosphorus Basic Steel Scrap, which a couple of weeks ago sold at about \$24, has sold at \$19; Horseshoes are \$18, net ton; Country Mixed Steel, \$15, gross ton; Old Iron Rails, \$23.50; Old Steel Rails for rerolling, \$21; Old Steel Rails, short pieces, \$19. We note a sale of 200 tons of Low Phosphorus Basic Scrap at a price equal to about \$19, delivered; 100 tons of Borings at about \$10.75, and 250 tons of No. 1 Railroad Wrought Scrap at \$20, net ton.

Coke.—Last week there were 19,629 ovens in the Connellsville region active and 509 idle, the output being 216,901 tons, a slight decrease over the preceding week. There is very little new demand for Coke, consumers being covered by contracts. We quote Furnace and Foundry Coke for prompt shipment at \$3 to \$3.25 a ton at oven. On contracts for extended shipment this price would be shaded.

Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets, Cincinnati, May 2, 1900.

The Pig Iron market at this writing is in about as unsettled a condition as it has been for years. There appears to be a widening gap between the ideas of quite a number of furnace interests, who have full order books, are unwilling to make concessions, and other furnaces, who, not being in so fortunate a condition, are putting Iron down considerably below where it has been within the past few months. It is almost impossible to make anything like correct quotations, the ideas as to values differ so widely. For instance, one seller, a party, by the way, entitled to credence, reports a sale of No. 3 Southern Foundry made in competition on the basis of \$15.75, Birmingham. The same seller also reports a sale of Gray Forge on the basis of \$14.75. Others quote No. 3 as low as \$15 and Gray Forge at \$14.25. The weakness is more apparent in the lower grades, Nos. 1 and 2 Foundry and Soft being unproportionately stiffer. The unsettled condition, of course, is not proving very attractive to buyers and there is no disposition shown from any quarter to buy for more than the closest immediate needs. The impending trouble with labor seems to be drawing to a head and the first actual step toward the strikes which have been talked of was taken to-day by the architectural iron workers in several of the local shops. These went out, their principal demand being for eight hours' work and nine hours' pay. All of this affects the general market somewhat; but little business is looked for that is not of a hand to mouth order. Freight rate from Birmingham is \$3.25 to this point, from the Hanging Rock district \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$20.75 to \$21.25
Southern Coke, No. 2.....	19.75 to 20.25
Southern Coke, No. 3.....	18.50 to 19.00
Southern Coke, No. 4.....	17.50 to 18.00
Southern Coke, No. 1 Soft.....	20.75 to 21.25
Southern Coke, No. 2 Soft.....	19.75 to 20.25
Southern Coke, Gray Forge.....	17.50 to 18.00
Southern Coke, Mottled.....	17.50 to 18.00
Ohio Silvery, No. 1.....	28.00 to 29.00
Ohio Silvery, No. 2.....	27.00 to 28.00
Lake Superior Coke, No. 1.....	22.00 to 22.50
Lake Superior Coke, No. 2.....	21.00 to 21.50
Lake Superior Coke, No. 3.....	20.00 to 20.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, Chilling	
Grades	\$25.25 to \$26.25

Standard Southern Car Wheel, No. 2..	24.75 to 25.25
Lake Superior Car Wheel and Malleable .....	..... to 26.50

Plates and Bars.—The market is still unsettled and quiet, though no further change in quotations is reported. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 2.03c., with half extras; small lots, 2.35c., with full extras; Bar Steel, in car lots, 2.10c., with half extras; small lots, 2.70c., with full extras; Iron Bar Angles, $1\frac{1}{2}$ x 3-16 inch and larger, in car lots, 2.30c.; small lots, 2.55c.; Sheets, No. 10, 2.50c.; No. 27, Steel, 3.10c.; Plates, 2.25c. to 2.50c.

Old Material.—Market is dull and weak and quotably lower than a week ago. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, \$19 per net ton; Cast Railroad Scrap, \$11 per gross ton; Cast Machine Scrap, \$11.25 per gross ton; Axles, \$20 to \$21 per net ton; Iron Rails, \$20 per gross ton; Car Wheels, \$21 per gross ton.

St. Louis.

Office of The Iron Age, 1905 Chemical Building, St. Louis, April 30, 1900.

Pig Iron.—The market continues practically unchanged. Moderate tonnage orders are being entered, the largest known order of the week being for 500 tons. Taking it all around, the situation is said to be better than expected. It is true that, in consequence of the reduction in Wire and Wire Nails, some purchases for Pig Iron are being held in abeyance. It is, however, the sentiment that the disturbance is but temporary and that renewed activity will soon be felt. This territory is well provided with modest foundries, whose business is of a nature not immediately affected by shocks at money centers, and this trade is in very good condition. Reports are verified as to the recent export engagements for nearly 75,000 tons of Southern Iron. The information is had that foreign inquiries are now in hand for 100,000 tons additional, for delivery during 12 months ending July 1 of next year. If the great foreign demand continues no radical changes can be expected in price of Southern Irons. There is said to be but little No. 2 Soft or Foundry Iron for immediate wants. For delivery after July a price of \$17, Birmingham, has been made on No. 2. Present freight to St. Louis is \$3.75. We quote on cars, St. Louis:

Southern, No. 1 Foundry.....	\$21.75 to \$22.00
Southern, No. 2 Foundry.....	20.75 to 21.00
Southern, No. 3 Foundry.....	19.75 to 20.00
No. 1 Soft.....	21.75 to 22.00
No. 2 Soft.....	20.75 to 21.00
Gray Forge.....	19.00 to 19.25

Bars.—No great movement has followed the recent published reduction. Consumers are buying as wanted, and, while individual orders are not large, the tonnage, on the whole, is fairly satisfactory and better than expected. What is more to the point, payments are coming in nicely. Mills are not yet entering up any considerable amount of new business, but say, on the other hand, that jobbers are taking regular deliveries. Mills quote Hoops and Bands, 2.70c., base; Iron Bars, 2.10c., base, half extras; Steel Bars, carloads, 2.15c., base, half extras, all East St. Louis. Jobbers quote Iron Bars, 2.35c., base; Steel Bars, 2.50c., base, both full extras, and prices are said to apply to large lots only.

Rails and Track Supplies.—Railroad business is moving along in satisfactory channels, and, the weather conditions being favorable for track operations, a fair amount of material is being put in place. We quote Splice Bars, Iron or Steel, 2.35c.; Track Bolts, with Square Nuts, 3.50c. to 3.60c.; with Hexagon Nuts, 3.70c. to 3.80c.; Spikes, 2.60c. to 2.70c.; Links and Pins, 3.10c.

Pig Lead.—Quite a good market can be reported this week, but the supply is somewhat restricted. Soft Missouri can be quoted at 4.55c.; Chemical, 4.57½c. to 4.60c. Ore sold at unchanged price of \$27 per 1000 lbs.

Spelter.—The demand is light and the nominal price is 4.45c. to 4.47½c. Zinc Ore is rather lower in top grade, for which \$31.50 per ton was obtained. Lower assay Ores were not proportionately affected.

Sidney H. Wheelhouse, formerly sales agent for the Chicago Pneumatic Tool Company, has been made second vice-president of the Standard Railway Equipment Company, St. Louis, effective May 1, and will be in charge of the pneumatic tool sales department for the West, with offices at 412 and 414 Lincoln Trust Building, St. Louis.

J. G. Miller, Security Building, St. Louis, has been appointed sales agent for the Pennsylvania Steel Company at that point.

Birmingham.

BIRMINGHAM, ALA., April 30, 1900.

The present conditions of the market are difficult to diagnose, but they are attributed almost solely to the action of the American Steel & Wire Company in so suddenly and so sharply lowering the price of their products in the face of what was supposed to be a favorable outlook for a steady trade at current values. The blow was entirely unexpected here, and, while it dazed the trade, no one lost his head and the market did not become demoralized. But the situation had to be faced and concessions in price were made. On a basis of \$17.50 for No. 2 Foundry a good trade was springing up and delivery for the last quarter of this year was coming into vogue. The export demand had taken hold again and inquiries were free. Transactions covered over 30,000 tons in one week, for delivery mainly during the last quarter of the year, and the demand was increasing. The price at which this business was taken is a matter of speculation. Some sellers declare they have sold nothing below the basis of \$17.50 for No. 2 Foundry, while others assert that the price was \$17 or less. The charge is made that the sales were made on the basis of \$16.50. But, assuming that the seller himself knew what he got for his goods, it seems safe to quote sales on the basis of \$17. There is no question that sales to the domestic trade have been made on that basis, for the orders registered show this to be so. On that basis orders were registered the past week and there was an increased demand, showing that the flurry had about ended.

The startling drop came at just the time when the Alabama Steel & Wire Company had started their works and were caring for orders. The cut in price of the American Steel & Wire Company was considered as a blow aimed at them, and steps were at once taken to protect their interests. From the territory which, naturally, they can claim by reason of location and contiguity as theirs, telegrams and letters have poured in expressing preference if protected in price. There was nothing else to do but to protect the customers that had come to them, and the cut made by the American Steel & Wire Company has been met, and the Alabama Steel & Wire Company have more orders than they can promptly care for.

The Dimmick Pipe Works met with a deplorable accident last Saturday. While placing the last truss that held the roof of the main foundry building in position some entanglement occurred, and it was thrown with violence against its predecessor, and this in turn against its predecessor, until the entire superstructure collapsed like a house of cards and fell to mother earth. The result was the loss of several lives and the wreckage of the building. The delay in the completion of the building will amount to fully one month.

The following new industries have either located or are about to locate here: A large planing mill have acquired a block of land and will erect a plant. A plow factory has acquired a tract of land near the rolling mill and will build their works there. The capital is \$100,000, and the parties at the head of it come from Atlanta, Ga. Then there is another company of which mention has been made with a capital of \$300,000, who will erect similar works. They have been prospecting for location, with the chances favoring North Birmingham. Besides these there are others knocking at our door. Subsidies and other aids that were in order a short time back are no longer countenanced, and such enterprises as are now coming are doing so on their own merits and standing on their own bottom. There is every evidence of other enterprises casting their eyes this way, and barring the unexpected, we will have a material increase to our industries before the end of the year.

The Republic Iron & Steel Company are preparing to build at Thomas new Coke ovens to the number of 400, for which 2,000,000 brick have been ordered of the Besheer Brick Company. The additional furnaces there are being erected, and the place bids fair to rival competitors in importance. Owing to ill health Sol Haas of the Sloss Iron & Steel Company has been granted a leave of absence for three months, and his present duties will be performed during his absence by T. H. Aldrich, who is well known to the Iron trade.

The Belgian Iron Market.

BRUSSELS, April 16, 1900.—Opinions are at present divided in Belgium regarding the true situation of the Iron market. No doubt the home market continues satisfactory owing to the extraordinary activity which is going on in all construction shops, especially in those which manufacture railroad material, bridges and framing. The bolt works have so many orders that they have concluded to advance prices. The nail works also were

very busy, but unfortunately they have just been stopped on account of a strike of the workmen for higher wages.

As far as the export trade is concerned, the situation is quite different. Two distinctly different views prevailed on the Coal and Metal Exchange which took place in Brussels last Wednesday. While certain Iron manufacturers declared that they were elated over the present state of business, saying that they were overwhelmed with orders for several months, claiming to be obliged to refuse new orders for the present, others, on the contrary, had been entirely without work and literally begged for export orders, offering reductions of 5 to 10 francs per ton.

These differences of situation are easily explained if one will take the trouble to examine the situation in detail. There are in fact several essential distinctions to be made, as follows:

1. The demand for Steel is greater than that for Iron.
2. Certain works supply the home market only, while the products of others are exclusively for export.
3. There are some works whose products are more appreciated and more sought for in foreign countries, even the products of rolling mills which are considered only second class.
4. Sheets, Rails and Wire are more neglected at present than Beams, and more particularly merchantable products, which makes a vast difference to the mills according to the specialty they manufacture.

5. When the continued rise of values took place a few weeks ago, certain manufacturers, thinking that the market would not stop rising, refused to accept any orders, while others, wiser than they, filled their order books with fine orders at good prices, which enables them today to bargain with the exporter. Those who had refused to make engagements became frightened when the rise stopped and in order to secure work they sent their agents everywhere, principally to London. They have thereby caused a drop in prices and did not secure any more orders for all that. They simply caused the market to lose some of its firmness and to weaken confidence in the future, so indispensable to business.

The situation for these few works is so bad that they have proposed to the others to shorten the hours of labor by mutual consent, by closing every Monday, for instance. The busy mills, however, did not favor this plan. They then proposed to found among all the rolling mills of Belgium a central office for the sale of their output for both home market and export. This plan was not considered by those mills whose trade mark is well known and who have a regular and old established trade. We think, however, that they were wrong as an arrangement of that kind would have rendered great service to all concerned.

Whatever may be the difference in the conditions of the various Belgian mills, we cannot overlook the fact that export business has become more difficult to secure than two months ago, although the beginning of spring, as a rule, is marked by a revival of business. The northern countries, especially Russia, did not bring to market this year their usual quota of orders. China, Japan and British India, Oriental Europe and Spanish-America have also reduced their purchases. Finally, the events which are taking place in the Transvaal influence the London market, upon which we are chiefly dependent for our export trade. In spite of all these causes of depression our exports for the first three months of the current year are not much inferior to those of the same period of last year. The shrinkage is quite insignificant. For 1900 we have 147,029 tons against 149,477 in 1899, being a decrease of only 2,448 tons, or 1.63 per cent., from which we may conclude that the export movement of Belgium suffers less in the point of quantities than that of prices.

Raw materials, Pig Iron, Scrap Iron and Steel Billets show a downward tendency, which even seems to affect prices. That this should be the case seems very strange, as the Belgian output of Pig Iron has been on the decline, with 288,900 tons during the first quarter of 1900, against 306,850 tons in 1899. It is true that exportation has slightly diminished while the importation has markedly increased. The following table will explain the situation:

	First quarter.	
	1900. Tons.	1899. Tons.
Belgian production.....	288,900	306,850
Importation.....	114,540	83,824
Totals.....	403,440	390,674
Exportation.....	2,070	3,287
Leaving for consumption.....	401,370	387,387

The result is that the available supply has been somewhat more important in 1900 than 1899. If the Belgian output has decreased while the demand increased it is due to the bad quality of Coke furnished by the syndicate (yielding too much water and ashes). This fact, coupled with the increasing exactions of this ill-omened

syndicate, perhaps the worst managed one in the world, has caused the owners of blast furnaces, with the exception of but two dissenters, to form a trust among them to buy Coal and turn it into Coke for the profit of its members. The society has been incorporated, and the building of plant has begun. The Coke ovens are erected on the banks of a canal, and in condition to utilize either Belgian, French, German, English, or even American Coal. We will here mention that a Philadelphia house have, within a few days, offered American Coal, and that their offer will probably be accepted. We advise them to address the new company, Société Métallurgique des Fours à Coke, which will begin operations at the very latest by the first of January, 1901. In fact, December 31, 1900, is the date on which the contract of most of the Iron manufacturers with the famous syndicate expires. The latter will now probably be dissolved, and its members will regain their liberty of action and will greatly regret having placed their business in the hands of incompetent and arrogant men who lost all.

To come back to the question of Coal, I will say that Coal continues as scarce as ever in Belgium and keeps getting dearer all the time. The average increase has been 10 francs per ton since April 1. The following are the present ruling prices, taken at the pit: Fines Malgres, 18 francs; Menus Quart Gros, 20 francs; Fines Demi-Grasses, 21 francs; Furnace Coal, large, 28 francs; Coke 40 francs. The cost of transportation from the pits to the furnaces averages from 1.50 francs to 2 francs, while imported Coal by sea will cost from 4.50 francs to 5 francs, according to distance. There is no duty on Coal in Belgium. Up to the present time America has sent us nothing in Coal. Regarding Pig Iron, Belgian importation has increased considerably, while American importation has notably decreased, in fact has gone down to one-half, being 1410 tons for the first quarter of 1900, against 2956 tons in 1899. In March last we received but 201 tons. What we need most is Forge Pig, and it is just this quality which it would be most profitable for America to send here. For this kind of Pig we depend upon the East of France (Langry), Luxemburg and German Lorraine.

I am sorry to mention that America has ceased to send us either Blooms or Billets, in which there is a fair profit to be made. However, she sends us Steel Wire, Merchant Steel, Old Iron, Iron Bars, Wrought Iron, and Galvanized Iron; but all these in very small quantities as the following list will show:

	First quarter, 1900.	1899.	Duty into Belgium per 100 kilos. Francs.
Steel Wire.....	268	None	1.00
Merchant Steel.....	33	62	1.00
Old Iron.....	680	7	Free
Iron Bars.....	3	28	1.00
Wrought Iron.....	35	9	4.00
Wrought Pig.....	11	33	2.00
Galvanized Iron.....	2	None	3.00

This seems but a very small matter; notwithstanding we are anxious to show American Iron manufacturers the way they may enter the market, and it is for that reason that we have mentioned the rates of duties.

We give below, as usual, quotations in francs per ton for the principal products:

	March 16, 1900.	April 16, 1900.	March 16, 1899.
No. 3 Luxemburg Foundry Iron.....	120.00	115.00 to 120.00	70.00
Luxemburg Mill Iron.....	115.00	110.00 to 115.00	60.00
Charleroi Mill Iron.....	125.00	120.00 to 125.00	67.00
Thomas Pig.....	135.00	125.00	75.00
No. 2 Bars, f.o.b. Belgian stations.....	230.00	225.00 to 230.00	155.00
No. 3 Bars, f.o.b. Belgian stations.....	235.00	230.00 to 235.00	160.00
No. 2 Bars, f.o.b. Antwerp.....	225.00	220.00	145.00
No. 3 Bars, f.o.b. Antwerp.....	230.00	225.00	150.00
No. 2 Beams, Iron or Steel, at mill.....	210.00	210.00	155.00
No. 2 Beams, Iron or Steel, f.o.b. Antwerp.....	195.00	190.00	150.00
Angles, f.o.b. Belgian stations.....	235.00	235.00	160.00
No. 2 Iron Plates, f.o.b. Antwerp.....	225.00	220.00	175.00
No. 3 Iron Plates, f.o.b. Antwerp.....	240.00	235.00	185.00
Homogeneous Iron Plates, f.o.b. Antwerp.....	260.00	260.00	210.00
No. 2 Plates, f.o.b. Belgian stations.....	225.00	225.00	180.00
No. 3 Plates, f.o.b. Belgian stations.....	240.00	240.00	190.00
Homogeneous Iron Plates, f.o.b. Belgian stations.....	260.00	270.00	225.00
Steel Plates, f.o.b. Belgian stations.....	250.00	250.00	190.00
Steel Plates, f.o.b. Antwerp.....	240.00	240.00	190.00
Sheets, f.o.b. Belgian stations.....	240.00	250.00	215.00
Steel Rails, f.o.b. Antwerp.....	170.00	165.00	135.00

New York.

Office of The Iron Age, 232-238 William street, New York, May 2, 1900.

Pig Iron.—A report of the condition of business and the character of transactions at present would require very few words. The only sales now being made are of small lots for prompt delivery. Buyers are ordering no more than absolutely necessary to keep their works running. Under the circumstances the tonnage covered by the business of the week is not large. It is difficult to forecast the future, but it would appear that this condition of affairs is likely to last until something positive takes place to revive the demand for finished products. Inducements in the direction of lower prices fail to make

buyers feel inclined to anticipate their wants even for a moderate period. While foundrymen generally are reported to have very small stocks, yet here and there one is found with more Iron under contract than he needs, and efforts are being made in such cases to effect resales. Quotations show practically no change, but they are naturally inclined to weakness, and buyers can probably do better on purchases of fair sized quantities. We quote as follows at tidewater: Lehigh and Schuylkill Irons, No. 1 Foundry, \$22.75 to \$23.75; No. 2 X, \$21.25 to \$22.25; No. 2 Plain, \$20.25 to \$21.25; Gray Forge, \$18 to \$19. Southern brands are quoted as follows: No. 1 Foundry, \$22.50 to \$23; No. 2 Foundry, \$21.25 to \$21.75; No. 1 Soft, \$22.50 to \$23; No. 2 Soft, \$21.25 to \$21.75; No. 3 Foundry, \$20.25 to \$21; Gray Forge, \$19 to \$20.

Cast Iron Pipe.—The successful bidders on the Water Pipe purchased by Newark, N. J., last week, covering in all 4500 gross tons of Pipe and Fittings, were the Warren Foundry & Machine Company and M. J. Drummond & Co. The latter secured all Pipe up to and including 24 inches, and the former the 36-inch Pipe, which, however, was the lion's share, comprising 3500 tons. Quite a good demand is reported for small sizes of Pipe, but the movement in large sizes is still slow. Boston gas companies will shortly purchase 1000 tons. All work now going up is for extensions and improvements, practically no new enterprises being under way in this section. Quotations are continued at \$28 to \$29 per gross ton for 8-inch Pipe at tidewater.

Steel Rails.—Inquiries are steadily coming up for fair sized quantities, but railroad companies are placing new business very cautiously. Rail mills are very well supplied with work, and are holding prices firmly at \$35 at mill in Eastern Pennsylvania for Standard Sections. Angle Bars are quoted at 2.20c. to 2.30c.; Spikes at 2.50c. to 2.60c.; Square Track Bolts at 3.50c., and Hexagonal Track Bolts at 3.75c.

Finished Iron and Steel.—The most important piece of work now in prospect consists of the approaches to the new East River Bridge, for which bids will be opened on the 31st. The approaches will take 18,000 tons of Steel. The Manhattan Elevated Railroad extension was expected to be placed by this time, but it is still in abeyance. Quite a number of large building projects are under negotiation, but are not yet in shape to be placed under contract. The demand for Plates, Bars and other forms of rolled products has been fair, and in some instances quite a little business has been done, but not enough to make the market at all satisfactory. We quote at tidewater: Beams, 2.40c. to 2.50c.; Angles, 2.40c. to 2.45c.; Universal Mill Plates, 1.95c. to 2c.; Tees, 2.40c. to 2.45c.; Channels, 2.40c. to 2.50c. Steel Plates are 1.90c. to 2c. for Tank, 2.10c. to 2.20c. for Shell, 2.30c. to 2.40c. for Flange, 3c. to 3.10c. for Fire Box, and 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.80c. for C. H. No. 1, 3.30c. for Flange, and 3.80c. for Fire Box. Refined Bars are 1.90c. to 2c.; Common Bars, 1.80c. to 1.90c.; Soft Steel Bars, 2.10c. to 2.15c., and Hoops, 2.70c. to 2.75c., base, on dock.

The Lackawanna Iron & Steel Company have removed their offices from 52 Wall street, which has been the headquarters of the company for a great many years, to the American Surety Building, 100 Broadway, New York City.

Metal Market.

Office of The Iron Age, 232-238 William street, New York, May 2, 1900.

Pig Tin.—During the week under review the market here has been quiet, with prices declining until yesterday, when a reaction set in as a result of the decrease of the visible supplies. This decrease is in consequence of the fact that there were no Banca or Billeton sales during the month of April, so that the new supplies which came into the statistics represented the shipments from Straits and Australia. During the present month, however, about 2250 tons of Banca will be sold, the effect of which on the statistical position will be seen by June 1. Judging from the present state of affairs in this country, an increase in the visible supplies during this month can be looked for. This market reached its lowest point on Friday with 29.25c. for spot. To-day it closed nominally at 30c. London closed to-day £137 2s. 6d. for spot and £136 10s. for futures. The total visible supply on May 1 is 3938 tons below that of April 1 of last year.

Copper.—The market is quiet and unchanged. Lake is quoted 17c., Electrolytic 16½c. to 17c., and Casting 16½c. to 17c. The business consummated throughout the week is said to have been on a rather small scale. The position of the market is very uninteresting. London declined during the week and closed to-day £76 7s. 6d. for spot and £75 7s. 6d. for three months' futures. Best Selected declined 10 shillings and is quoted £80.

The exports of domestic Copper from Atlantic ports for the month of April, as per official returns, and com-

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING MAY 2, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
\$29,000,000	Am. Car & Foundry, Common...	13,799	157½-161¼	161½-165¼	16 -16½	153¼-16½	157½-163¼	16 -16½
29,000,000	Am. Car & F'y, Pref. (7½ Non-Cu.)	7,307	65½-66¼	65½-66¾	-66	65 -65¾	65 -65¾	65¾-66
19,000,000	Am. Steel Hoop, Common.....	5,505	27 -27¼	27 -27¾	26 -27	25½-26½	25½-26½	25 -25¾
14,000,000	Am. Steel Hoop, Pref. (7½ Cu.)...	3,365	75½-75¾	75½-76	-75	74½-75	73¾-74½	73 -73¾
50,000,000	Am. S. & W., Common.....	57,350	41½-42¼	41 -42	38 -41	37½-39¾	39 -40½	38 -39¼
40,000,000	Am. S. & W., Pref. (7½ Cu.).....	17,782	70 -70¾	78¼-79	77½-78¼	75¾-77½	77 -77¾	76 -76¾
28,000,000	Am. Tin Plate, Common, N. Y....	3,250	-28	.....	27½-27¾	26¾-27	-26½	25 -25½
18,325,000	Am. Tin Plate, Pref., N. Y. (7½ Cu.)	5,920	79½-80	79½-80	.....	78 -79	-78	77 -77¾
7,500,000	Bethlehem Iron.....	894	57¼-59	-59	.....	.....	.....	.....
15,000,000	Beth. Steel, Par \$50, \$1 paid in...	190	17 -17½	.....	.....	.....	.....	-17
7,974,550	Cambria Iron, Phila*.....	31	.....	-44½	.....	-44	-43¾	.....
16,000,000	Cambria Steel**.....	5,222	20½-21	20½-21	20½-21	20 -20½	-22½	19¾-20
11,000,000	Col. Fuel and Iron.....	7,660	43 -43	42¼-43½	41¼-42	40¾-41½	-41¼	39¾-41
46,484,390	Federal Steel, Common.....	60,417	42¼-43¾	42¼-44	40¾-42¾	40¾-41½	41¾-42¾	39¾-41
53,253,500	Federal Steel, Pref. (6½ Non-Cu.)	6,515	71 -71½	70¾-71¾	69¾-70¾	69¾-69¾	69 -69½	68¾-69
32,000,000	National Steel, Common, N. Y....	8,203	-36	-36	33 -35½	33 -34	33½-34	32 -32¾
27,000,000	Nat'l Steel, Pref., N. Y. (7½ Cu.)	2,607	.....	90 -90¼	-89	-89	-89	88 -89
40,000,000	National Tube, Common, N. Y....	6,490	51 -51¾	-50¾	-51	49 -51¼	49½-50½	48½-49½
40,000,000	National Tube, Pref., N. Y.....	5,019	-90¾	91 -91¼	-91	90¾-91¼	.....	89¾-90½
5,060,000	Penna., Common, Phila.....	.....	.....	.....	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	1,480	-48½	-48	-47	46 -46½	45½-47½	46¾-46¾
12,500,000	Pressed Steel, Pref. (7½ Non-Cu.)	395	.....	-82	81½-82½	.....	.....	.....
27,352,000	Republic Iron & Steel, Common...	11,591	-18½	18 -18½	17½-17¾	17 -17½	15¾-16¾	14¾-16½
20,852,000	Repub. Iron & Steel, Pref. (7½ Cu.)	7,187	.....	59¾-60	.....	59¾-59¾	55 -59	52 -56¾
20,000,000	Tennessee Coal and Iron.....	17,385	84 -85	84 -85½	81½-84	80¾-82	81½-82	76 -81¾
1,500,000	Warwick Iron & Steel (par \$10)...	122	-9¾	.....	.....	-9½	.....	-9½

* Par \$50. ** \$9 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

Bonded indebtedness: Am. S. & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$13,200,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; National Tube, none; Tennessee C. & I. R. R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%; Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899.

piled by the New York Metal Exchange, reducing the Matte at 55 per cent. into fine Copper, were 11,875 tons of 2240 lbs.

During the same month the following arrived at New York and Baltimore:

From Europe.....	1396 tons Copper
Mexico.....	716 tons Copper
South America.....	450 tons Copper
Europe.....	5 tons Matte
Europe.....	129 tons Ores

Total exports since January 1, 1900, exclusive of Southern ports for April..... 56,554 tons
Against same period in 1899..... 36,055 tons

Pig Lead.—There is absolutely no change. Business continues in a small, steady way, and prices are unchanged. The American Smelting & Refining Company still quote 4.70c. to 4.75c. for spot and futures, New York delivery. London has declined slightly and Soft Spanish is quoted to-day £16 17s. 6d.

Spelter.—Is very weak and it is said that it can be secured for any delivery prior to July for 4.55c., New York, while the highest bidding is said to go but to 4.50c. There is scarcely any buying movement. London has declined again and comes at the close to-day £21 15s.

Antimony.—Is without change, Hallett's being quoted at 9¼c. and Cookson's 10½c. to 11c.

Nickel.—Is firm and unchanged, being quoted 42c. to 50c., according to size and conditions of order.

Quicksilver.—Wholesale lots of 100 flasks and more are quoted at \$51 per flask of 76½ pounds. London is unchanged at £9 10s.

Tin Plates.—Remain unchanged, with but a fair buying movement. The prices quoted by the American Tin Plate Company are unchanged on the basis of \$4.84 per box of standard 100-lb. Cokes or \$4.65, f.o.b. mills.

Iron and Industrial Stocks.

The course of the past week in the stock market has not been very satisfactory to the holders of industrials. American Steel & Wire stock was driven down on Saturday by reports that the Carnegie Steel Company are arranging to manufacture wire rods. Republic Iron & Steel stock was attacked this week on the rumor that litigation of a damaging character to the company was about to be undertaken. Both reports were denied by the parties immediately interested.

	Bid.	Asked.
American Bicycle Company, common.....	9¼	10¼
American Bicycle Company, preferred.....	39¼	41
American Bicycle Company, bonds.....	85	85
E. W. Bliss, common.....	137½	137½
E. W. Bliss, preferred.....	125	125
Diamond State Steel.....	4¼	4½
International Silver, common.....	7	8
International Pump, common.....	18	19¼
International Pump, preferred.....	65	66
Otis Elevator, common.....	28	30
Otis Elevator, preferred.....	86	88
U. S. Projectile.....	105	105
Sloss & Sheffield Steel & Iron, common.....	22	26
Sloss & Sheffield Steel & Iron, preferred.....	65	67

Tidewater Steel.....	13¾	13¾
U. S. Cast Iron Pipe Company, common.....	5	5½
U. S. Cast Iron Pipe Company, preferred.....	4¼	4½
H. R. Worthington, preferred.....	115	117
Empire Steel, common.....	20	20
Empire Steel, preferred.....	60	60

The Colorado Fuel & Iron Company have issued the following statement of net earnings:

	1900.	1899.	Changes.
Month of March.....	\$242,900	\$94,549	Inc. \$148,351
From July 1.....	1,749,332	786,377	Inc. 1,012,955

Deducting from the nine months' net earnings of \$1,749,332, given above, fixed charges for 12 months ending June 30 next, including bond interest, taxes and preferred stock dividend (aggregating \$600,000), there is left a surplus of \$1,149,322.

The listing of additional stocks by the American Tin Plate Company and the National Steel Company, to which reference has been made in the daily papers of the past week, was simply the transferring to New York of stock listed last year in Chicago. It was not done for the purpose of acquiring more property, as the transactions reported in the same connection occurred a year ago.

A statement has been put out by the American Car & Foundry Company showing the result of the operations of the company for the 12 months since their organization, as follows: Net earnings for the 12 months ending February 28, 1900, were: First quarter, \$658,816.88; second quarter, \$930,611.74; third quarter, \$1,127,983.98; fourth quarter, \$1,368,539.19, making a total of \$4,085,951.79. There is required to pay for quarterly dividends \$2,036,300, leaving a surplus for the twelve months of \$2,049,651.79. The profits from the sale of products, exclusive of freight and passenger cars, for the 12 months, were \$1,179,338.

The United States Cast Iron Pipe & Foundry Company have declared a dividend of 1¼ per cent. on the preferred stock, payable June 1.

The American Iron & Steel Company, Philadelphia, have declared a dividend of 50 cents per share, payable May 31. It is inferred that the total dividend for the year will be \$1.50 per share, or 30 per cent. on the \$5 paid in on the stock.

It is stated by the American Smelting & Refining Company that the \$1,000,000 first mortgage 6 per cent. bonds of the Consolidated Kansas City Smelting & Refining Company, which mature on May 1, will be redeemed on that date out of the earnings of the American Smelting & Refining Company. The only remaining bonds of constituent companies will then be about \$1,133,000 first mortgage 6 per cent. bonds of the Omaha & Grant Smelting Company. As there is a sinking fund provision for the retirement of these at the rate of about \$70,000 per year this indebtedness will hardly be felt by the American Smelting & Refining Company.

The Westinghouse Electric & Manufacturing Company of Pittsburgh have declared a quarterly dividend of 1½ per cent. on their assenting stock, payable May 15.

The H. C. Frick Coke Company of Pittsburgh announce that they will pay off on August 1 their remaining outstanding 6 per cent. gold bonds, amounting to \$500,000, at par and accrued interest.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, New York, May 2, 1900.

Market conditions remain practically unchanged. If there is any change to be noted it must be said that the feeling of quietness is being more universally expressed than at any time within the last few weeks. It is still the concern that are able to furnish tools immediately that are getting the machine tool business. Orders for machines on distant delivery are by no means numerous. The fact that buying is on a hand to mouth basis is getting to be an old story. During the last week this story has been emphasized, however, and machinery merchants do not hesitate in saying that the recent disturbance in the wire trade has somewhat of an effect. The active buying on the part of the Government departments has created a fair outlet of late, and considerable interest is centered upon those branches of the Federal service which are most active in this respect, the army and navy.

There is a good second-hand business going through. We hear of one concern who are extremely busy on back orders. Their works, which, by the way, are rather large, are in fact too small to cope with the work. Instead of buying the machines which they need, in order to fill their orders, they are renting idle machines in the neighboring shops. This is but an illustration of a large busy concern who do not place faith in the future.

The demand from abroad has eased up considerably, thus making the export outlet pretty small.

As a result of present conditions the stock of machine tools on builder's hands is increasing rapidly. It is rumored that one very large concern who build but one line of tools have accumulated a stock of more than 200 machines. One of the officers of the company sailed for Europe recently. Among the largest purchasers in the market during the last week were the Columbia Electric & Vehicle Company of Hartford, Conn. It is said that they purchased upward of \$20,000 worth of machine tools, including engine lathes, profilers, turret machines, &c.

The Electric Air Brake Company of 141 Roebing street, Brooklyn, N. Y., have been shopping about recently for \$25,000 worth of machine tools. Whenever they were enabled to pick up the tools which they required, for spot delivery, they purchased them.

Doubtless the largest deal consummated in the machine tool line was the closing of the additional equipment for the Springfield Armory, Springfield, Mass. The awards were made as follows:

Manning, Maxwell & Moore.

Ten No. 2 two-spindle profiling machines.
Three No. 1 two-spindle profiling machines.
One 14-inch pillar shaper.
Sixty-six No. 2 Lincoln milling machines.
One 16 x 15 x 4 foot planer.
Three engine lathes, 14-inch swing, 6-foot bed.
One 24 x 24 x 6 foot planer.
One No. 5 oil filter.

Niles Tool Works Company.

One No. 3 bench lathe, 32-inch bed, 7-inch swing.
One Automatic knife grinder.

Garvin Machine Company.

One single profiling machine, circular table and power feed.
Six No. 2 two-spindle profiling machines.
Five No. 3 hand milling machines.
One tool makers' engine lathe.
One duplex drilling lathe.
One special hand lathe, 12-inch swing, 7-foot bed.
Four single spindle drill presses.
Three three-spindle drill presses.
Seven barrel turning lathes.

Whitney Mfg. Company.

Two hand milling machines.

Prentiss Tool & Supply Company.

Two No. 3 bench lathes, 7-inch swing, 32-inch bed.

Chandler & Farquhar.

One double saw bench.

Brown & Sharpe Mfg. Company.

One universal milling machine.

Cleveland Machine Screw Company.

One automatic $\frac{3}{8}$ -inch screw machine.

The Billings & Spencer Company.

Five 400-pound drop hammers.

The Pratt & Whitney Company.

One No. 3 screw machine.
One engine lathe, 16-inch swing, 8-foot bed.

Four engine lathes, 13-inch swing, 6-foot bed.
One pattern makers' lathe, 24-inch swing, 8-foot bed.
Seventeen P. & W. rifling machines.
Two punch presses.
Two P. & W. gun barrel drilling machines.

Bement, Miles & Co.

One vertical shaving machine.

Dwight Slate Machine Company.

Seven three-spindle sensitive drills.
One 4-inch automatic pinion cutter.

Hill, Clarke & Co.

One adjustable single action punching press.
One slotting machine, 6-inch stroke.
One 10-inch tool makers' engine lathe.
One 150-pound Bradley hammer.
One 4-inch Merriman bolt cutter.
One No. 1 B. & S. grinder.
Two 16 x 16 x 3 foot planers.
One 20 x 20 x 5 foot planer.

Fuel Economizer Company.

One Green fuel economizer.

The Gordon Press Works.

One printing press.

George F. Blake Mfg. Company.

One combined steam and power pump of 1000 gallons capacity per hour.

A. W. Banister.

One exhaust fan with piping complete.

The Babcock & Wilcox Company.

Five 175 horse-power water tube boilers.

American Wood Working Machine Company.

One band saw.

Bids were opened at the Bureau of Supplies and Accounts, Navy Department, on April 24, for supplies and machinery. Following is the result of the machinery bidding:

Bidder 1. J. H. Day & Co., Cincinnati.
2. Parke & Lacey Company, San Francisco.
3. Anderson, Dupuy & Co., Pittsburgh.
4. A. L. Ide & Sons, Springfield, Ill.
5. Niagara Machine & Tool Works, Buffalo, N. Y.
6. Prentiss Tool & Supply Company, New York.
7. Manhattan Supply Company, New York.
8. Henshaw, Buckley & Co., San Francisco.
9. Riehl Bros. Testing Machine Company, Philadelphia.

10. Manning, Maxwell & Moore, New York.
11. Chas. Ross & Son Company, Brooklyn, N. Y.
12. M. M. Buck Mfg. Company, St. Louis, Mo.

Class 1. One standard testing machine.—Bidder 9, \$250; 7, \$447; 12, \$600.

Class 2. One standard cement testing machine.—Bidder 12, \$250; 6, \$600; 9, \$600.

Class 3. One standard testing machine.—Bidder 9, \$850; 7, \$868; 12, \$880.

Class 4. One automatic cut off steam engine.—Bidder 8, \$3140; \$7740 and \$12,700; 6, \$4000; 4, \$4300 and \$5000.

Class 5. Two power pipe threading and cutting machines.—Bidder 10, \$852 and \$960; 8, \$992; 6, \$1038; 12, \$2114.

Class 6. One double crank press.—Bidder 5, \$1203; 3, \$1222.50.

Class 7. One twin white lead and color mixer.—Bidder 1, \$270; 10, \$345; 11, \$345; 2, \$359; 6, \$366; 7, \$180 and \$267.

Class 8. Two 18-inch single iron paint mills.—Bidder 1, \$113.50; 6, \$146; 11, \$195; 10, \$195; 2, \$206; 7, \$180 and \$267.

Class 9. One white lead mixer.—Bidder 1, \$177; 6, \$188; 10, \$195; 7, \$197.50 and \$215; 11, \$195; 2, \$196.

Class 10. One single gap lathe.—Bidder 2, \$846; 10, \$875 and \$900; 6, \$970.

No award has yet been made on the bids opened April 14, for a pumping plant for dry dock No. 1, at the Brooklyn Navy Yard.

Upward of \$150,000 is being spent by J. G. White & Co. of 29 Broadway for materials to equip an electric lighting and power plant in Colorado. They have awarded contracts for two 1100 horse-power horizontal cross compound Corliss engines to the International Power Company of Providence. A contract has also been given to Auhman & Taylor of Mansfield, Ohio, for five 400 horse-power horizontal water tube boilers. White & Co. have also awarded a contract to Woolston & Brew of 161 Broadway for two 350 horse-power Fisher engines. They are to be added to those recently purchased from this firm for the San Juan & Rio Piedras Railroad of San Juan, Porto Rico. In addition to the engines, three 250 horse-power Cahall boilers have been purchased and two 225 kw. electric generators.

J. G. White & Co. are now in the market for two 600 horse-power cross compound condensing engines, which are to be installed in one of the power stations of the Toledo & Monroe Electric Railway. This road connects Toledo, Ohio, with Monroe, Mich.

An entire new shipbuilding plant will be erected at Weymouth, Mass., by the Fore River Engine Company. It will be recalled that this company were successful bidders on a number of torpedo boats and destroyers for the United States Navy. The company have just purchased a 350 horse-power tandem compound condensing Hamilton Corliss engine from Hooven, Owens & Reutheiler of 39 Cortlandt street. This company have also been awarded the contract for the 750 horse-power cross compound condensing engine which the New Jersey & Hudson River Railway & Ferry Company have purchased and will install at Edgewater, N. J.

The New York Rubber Company of Matteawan, N. Y., have just placed contracts for the steam plant which they are installing supplementary to their water power plant. Charles A. Hague of 39 Cortlandt street has been retained as consulting engineer for the company. The Fishkill Landing Machine Company of Fishkill Landing, N. Y., were awarded the contract for the engines. The Oil City Boiler Works of Oil City, Pa., captured the boiler contract, and McMurray & Co. of Troy, N. Y., received the order for the driving shaft, quill and dam wheel, clutch, &c.

F. H. Gottlieb of 136 Liberty street has received the contract for the power transmitting machinery and apparatus to be installed in the new plant which the Simmons Mfg. Company are erecting at Newark, N. J.

McClave, Hamilton & Rimmer of 85 Liberty street received an order from the New England Gas & Coke Company for a large tar pumping plant to be installed at the Everett works of the company. They also received good orders from the Barber Asphalt Company for the Philadelphia plant and from the S. Flory Mfg. Company of Bangor, Pa.

The Buffalo Cotton Mills of Union, S. C., have ordered their entire heating and ventilating plant and induced draft apparatus from the Buffalo Forge Company of 39 Cortlandt street. The heating plant will consist of two $\frac{3}{4}$ -inch housing fans with special blast wheels of 12 feet diameter, two 12 x 14 direct connected horizontal engines, and 16,000 feet of heating surface. The induced draft plant will consist of two $\frac{3}{4}$ -inch housing fans, with special blast wheels of 10 feet diameter, and especially designed water jacket bearings, each direct connected to a 9 x 12 horizontal engine. The Buffalo Forge Company were also awarded a contract for a heating and ventilating plant from the Symphonian Mfg. Company of Asbury Park, N. J.

The Northern Engineering Company of 39 Cortlandt street have secured an order from the Frank Ibert Brewing Company of Brooklyn, N. Y., for a complete power and lighting plant and a number of small motors and generators, which will be direct connected to engines of the Buffalo Forge Company's make.

Hoover, Owens & Reutheiler have received an order for a 150 horse-power engine from the John J. Crooke Company, who are building a tin foil plant at 186 Grand street, New York.

On Thursday, May 17, the Lee & Osborn Company of New Haven, Conn., will sell at public auction the entire plant of wheel making machinery and tools which were formerly used by the New Haven Wheel Company, York and Ashman streets, New Haven.

We are advised that the Goubert Mfg. Company of New York City, manufacturers of Goubert feed water heater, Stratton separators, and ice machine condensers, have taken offices at 85 Liberty street, where they will be after May 1. The past year has been one of the most successful in the history of the company, orders being larger and more numerous. They have established an entirely new plant at Bayonne, N. J., which they have thoroughly equipped throughout with the most modern of machinery for the better production of their specialties.

The Boston Machinery Market.

Office of *The Iron Age*, 33 Mason Building, }
Boston, April 30, 1900. }

Business has shown a little less activity among the machinery concerns in this section during the month now ended, and it has been observed that there is more drumming for trade nowadays than was necessary in the not very remote past. As one of the largest houses puts the case, "The future is beginning to be more important, and the Scriptural injunction to take no thought for the morrow is less widely obeyed." Nevertheless there have been some excellent contracts on the market during the past three or four weeks, and Boston dealers have secured a fair proportion thereof. While the general run of business is undoubtedly getting into somewhat nar-

rower grooves, owing to the fact that fewer new enterprises are projected for the current year, compared with the outlook at this period in 1889, there is a fair volume of orders from existing plants for occasional additions and replacements, and the aggregate amount from various sources, combined with Government contracts in view, makes up a sizable total.

New England concerns come in for a share of the equipment at the Springfield Armory, and are looking for a slice of the Boston Navy Yard's appropriation. Among other contemplated improvements at the Navy Yard is an addition to the rolling mill plant, in the shape of a couple of wings, one of them being planned for 281 x 78 feet, and the other 250 x 86 feet. One of these additions will be devoted to the storage of coal, coke and materials, and will probably require handling machinery. The Fore River Engine Works, with their large Government vessel contracts, necessitating an increase in their equipment of heavy machinery, have been in the market lately for additional tools and machines. Two very heavy lathes, with 60-inch swing and 90-foot bed, together with other machine tools, making an aggregate order to the value of \$25,000 or more, are credited, it is reported, to the Fitchburg Machine Works as the successful bidder. The Morgan Engineering Company have also secured from the Fore River concern an order for a 40-ton traveling crane, a 25-ton forge crane, and one 10,000-pound steam hammer.

The Boston Elevated Railway Company are actively engaged in pushing matters for the overhead lines now under construction, and the three big concerns which are competing for the motor contracts are on the anxious seat regarding the outcome of the tests that have been given their sample outfits. Last Friday night the final official trial trips were made through the subway by the Sprague, Westinghouse and General Electric company engineers, accompanied by engineers of the elevated company. Computations based upon the various tests made in the past fortnight will be made and as the contract is expected to be a good one for the winner, much will be made of the award by whichever company is successful. Many of the contracts for machinery for the new power stations have been given out. The Morgan Engineering Company have recently received an order for a 40-ton crane for the Atlantic avenue power station going up at Lincoln wharf.

The Barr Pumping Engine Company have been awarded the contract for the pumping outfit for the Haverhill, Mass., water works station. They will install a 6,000,000-gallon engine.

At the American Machine & Tool Company's works in this city good orders are in hand and prospects are reported excellent for continued activity in a satisfactory degree. Less business has resulted from the American occupation of Cuba and Porto Rico than was anticipated in the line of sugar making machinery, but the outlook is improving in that direction, and trade with the islands may be expected to broaden eventually.

Word comes from Worcester that the Washburn Wire Company, for some time in process of formation, have been incorporated within a few days under the laws of the State of Maine. They are to start with \$1,500,000 capital, which has been underwritten, it is stated, and will erect a large wire plant in the city of Worcester. This will be operated under the management of Charles G. Washburn, formerly of the Washburn & Moen Company.

The Hunter Machine Company have called for bids for a new foundry to be erected at North Adams, Mass.

Messrs. Harlow and Githen of the Ingersoll-Sergeant Drill Company's Boston office have been booking some good orders lately for air compressors. They have just delivered to E. W. Everson, for use on the Hyde Park high level aqueduct work, eight steam rock drills and a 22 $\frac{1}{4}$ x 24 class A air compressor. The Boston & Maine and Fitchburg railroads have also each received from the same manufacturers a large air compressor machine.

An early start will be made on the tunnel under a portion of the harbor from East Boston to the Hub proper. The contract for the first section has been awarded to the National Contracting Company, their bid being \$77,386.50. This tunnel will be similar in character to the central subway, and large quantities of steel will enter into its construction. Competitors of the National Company were H. A. Hanscomb & Co., who bid \$83,797; United Engineering & Contracting Company, \$84,404; C. H. Eglee & Co., \$87,869; W. H. Keyes & Co., \$94,997; Jones & Meehan, \$97,693.

The Chapman Valve Company will remove from the Mason Building this week to 94 Pearl street, having leased the quarters formerly occupied by the American Wood Working Machinery Company for their Boston salesroom.

J. P. Fitts, formerly with the Boston office of the Niles Tool Works, and representing the Morgan Engineering Company here, has taken quarters at the corner of Oliver and High streets.

The American Sheet Steel Company.

The affairs of the American Sheet Steel Company have now been satisfactorily arranged, the company have taken charge of the various properties included in the consolidation, and all the important details of their business are being directed from their headquarters in Battery Park Building, New York. As stated in previous issues of *The Iron Age*, the company now have possession of nearly all the establishments manufacturing light sheets in the United States. Several mills in the eastern part of the country are operated independently, but no antagonism is manifested by such concerns, and it is expected that from this time forward the light sheet business will be conducted under conditions which will assure stability to the trade.

It is the intention of the American Sheet Steel Company, as outlined by the managers, to establish the most pleasant and satisfactory relations with all interests handling or consuming sheet iron or sheet steel. The policy of the company will be to maintain prices at a point which will yield a reasonable manufacturing profit. They do not propose to fix purely arbitrary prices, calculated to extract from the trade as high rates as it is possible to charge, but to take actual cost of materials, labor and incidentals and simply base their selling price on a fair return on such costs and the risks of business. They have therefore decided to maintain prices at about the rates which have recently prevailed. These prices have in conspicuous instances been actually below the cost of production at some of the mills now embraced in the consolidation. It is not their intention to advance prices unless the cost of materials should make this absolutely necessary. It is their purpose to keep prices as reasonable as possible, so as to broaden consumption and increase business rather than to restrict it.

The price of sheets, it may be stated in this connection, was not advanced to as high a point as numerous other iron and steel products. For instance, the advance from the lowest point in pig iron, steel billets and bars averages at least 125 per cent. In fact, on some products the advance has been from 150 to 200 per cent. Steel sheets, however, have only advanced about 70 per cent. above their lowest price. This comparison not only shows that sheets have been handled conservatively, but that reactions in price may take place in other products, on which rates have been advanced heavily, without any valid reason for disturbing the sheet market. The American Sheet Steel Company therefore look forward to a period of stability in sheet prices.

The policy of the company will be to protect legitimate distributors who actually carry stock, avoiding brokers and commission houses, except those employed in the export trade. The representatives of the company at leading trade centers are men who are entirely familiar with the requirements of the trade, and therefore the company hope to keep constantly in close touch with their customers. They have been careful in appointing their representatives to retain many of the leading men in the field. They have further decided, in the interest of distributors, not to change the terms which have so long been in vogue in the sheet trade. Instead of making a radical change to net cash in 30 days, they will make all sales subject to terms of 2 per cent. off for cash in 10 days.

All the company's products will be quoted at a delivered price. This, it is claimed, will be a decided advantage to buyers. In the sheet trade claims are frequently made against railroad companies for damages to goods in transit, and such claims are always liable to be of long standing before they are the subject of settlement. The American Sheet Steel Company, however, in making deliveries will assume all troubles of this character, and by putting themselves in a position to deal directly with railroad companies will save a great deal of annoyance to their customers.

A special feature, which will undoubtedly be approved by the trade generally, will be the manufacture of precisely the same qualities and the preparation of packages for shipping in precisely the same way at all mills. In every instance the quality and gauge of every sheet will be guaranteed at all the company's mills throughout the country, it being the aim of the American Sheet Steel Company to elevate their entire product to the highest standard. It will not be their purpose to antagonize manufacturers of specialties produced from sheets. Their trade will be conducted in such a manner as to completely protect all their customers.

The export trade is expected to be an important feature of the company's business. They believe that this country should have a large share of the sheet trade of the world, and it will be their object to cultivate a business of this kind in every legitimate way.

Last week the Bessemer Coke Company, Lewis Block, Pittsburgh, turned out a quantity of coke at their

New Griffin Works in the Klondike district of the Connellsville coke region, which gives them the distinction of being the pioneers in this new field, so far as the actual production of coke is concerned, being the first to make coke there. Their plant is laid out for a block of 250 ovens, and they have nearly 100 completed and are now waiting for railroad connections with the Southwest Pennsylvania Railroad, who are building a branch from Lachrone to their works. Analyses made from this coke by Wuth and Stafford prove it to be all that was expected of it, showing it to be extremely uniform in character, and equal in all respects, and superior in some, to coke made in any of the other districts of the Connellsville region. The following is the last analysis taken: Volatile matter 0.26 per cent.; fixed carbon, 89.15 per cent.; ash, 9.85 per cent.; sulphur, 0.73 per cent.; phosphorus, 0.009 per cent.

Harnessing Lake Superior.

DULUTH, MINN., April 28, 1900.—In a December issue of *The Iron Age* this correspondence referred at length to the work undertaken at Sault Ste. Marie, the outlet of Lake Superior, by the Lake Superior Power Company, under their general manager, F. H. Clergue. A statement by Mr. Clergue to your correspondent was added relating to the Helen mines, at Michipicoton, Lake Superior, that his company were then opening and from which they expected to make large shipments this year. Since then much has been printed about the company and their intentions, but a statement of some interesting features of their proposed work is yet in order, and with them the connection between this company and some of the new steel making projects for Canada that have not been known to be connected with Mr. Clergue's plans.

Late press dispatches have referred at length to the plans of Philadelphia capitalists for establishing at Collingwood, Ont., a large furnace and steel making plant. As it happens, these and other Philadelphia people are among the heaviest backers of the Lake Superior Power Company. It is their millions that are building at the Sault the greatest water power plant in the world. They have established there one of the largest pulp mills in existence, and are to manufacture chemicals, &c., on a magnificent scale. At Collingwood they are but 350 miles from the Michipicoton mine, all but 12 miles being water transport, and they are in the heart of an oil and gas region. They are also well located for the shipment of products both to the United States and foreign markets, and are assisted into protected markets by a liberal bonus.

A company, of which Capt. Alex. McDougall of Duluth is at the head, have received concessions from the city of Collingwood and are establishing there a shipyard that will by another season have capacity for the construction at one time of five steel ships, and will have a dry dock that will receive the largest vessels in the Canadian lake marine. This company expect to build a large number of what may be called "canalers"—that is, ships of a size permitting them to navigate the St. Lawrence and Niagara canals. These ships must not be more than 265 feet long and 45 feet beam, and when passing the canals must not be over 14 feet draft. Some will be for lake and canal trade exclusively, and some will probably be so built that they can successfully pass into the Atlantic and serve there the winter months. Captain McDougall is well known as the inventor of the whaleback type of ship, and his success in interesting capital and building that style shows the energy and force of this hard headed, vigorous Scotchman. He was the first man to pass a loaded lake ship into the ocean, one of his whaleback steamers having carried a cargo of 80,000 bushels of wheat from Duluth to Liverpool, and he has since then been carefully watching for the time when there would be uninterrupted navigation from fresh to salt water. His company are now erecting their works and are placing machinery.

As to his mines Mr. Clergue quite lately said: "We have made contracts with Powell & Mitchell of Marquette for the mining, crushing and delivery on cars at the mines of 1000 tons daily by May 15, to be increased to 3000 tons by July 15. Crushers, and other mining machinery, as well as rolling stock of the most approved nature, are at the mines, and the construction of road and docks is well advanced."

The power works now under way at the American side of the Sault rapids consist of a canal 2 miles long, debouching into a wide forebay and passing through a power house 1368 feet long, crossways of the stream, where are to be set 320 turbines, tandem in fours, built by the J. & W. Jolly Turbine Company of Holyoke, Mass., and 80 Westinghouse dynamos, one to each four wheels. The canal is to carry 30,000 cubic feet of water per second (the outflow of Lake Superior does not

exceed 70,000 cubic feet), and it is to furnish 40,000 horse-power, contracts for the use of which have been made with other concerns intimately connected with the power company.

The power canal has an intake opening, it is stated, of 15,000 square feet, and a section in its general course of from 4100 to 4300 square feet. The depth of water will be 22 feet. Nearly 1 mile is through rock, and the balance through gravel and sand. It has been constructed very carefully in order to lessen friction and permit the unrestricted flow of water to the penstocks. About a third of the 1,500,000 cubic feet of excavation required for the canal has been completed, and 15,000,000 feet of timber have been bought for various uses in connection therewith. The power house is built above water, of native sandstone, quarried from the canal and other excavations.

It was noted in this correspondence some weeks since that the company had secured four steamers in England that were to be brought to Lake Superior soon after the opening of navigation, for carrying ore from the Helen mines to works in Lower Canada. Mr. Clergue tells me that instead of four there will be eight, and that each steamer will later be followed by a barge, the pair carrying not less than 5000 tons, and that not only ore but pulp, steel and other freight will be carried. The company have an enormous concession of pulp lands north of Lake Superior in Upper Ontario, and will probably be one of the largest, if not the largest, makers of pulp for the lower grades of paper in time to come. This pulp wood concession is one of the chief causes of all their activities.

D. E. W.

The Cleveland Labor Situation.

A dispatch from Cleveland states that there has been another break in the ranks of the striking machinists in that city. One hundred and fifty of the machinists employed by the Cleveland Machine Screw Company held a meeting in the company's shop last Thursday and they were addressed by an official of the company. A vote was taken and 72 elected to return to work. Friday morning 70 of these were in their places. Those who were dissatisfied with the former meeting to the number of 57 held another session and 27 voted yes, and 30, no. Of the number allowed to vote three were apprentice boys and two had never been in the company's employ. Since then a number of these men have returned to work, and the company now have about 115 men in their shop. The Cleveland Punch & Shear Company, the Kilby Mfg. Company and one or two other concerns have succeeded in importing a number of men and they are boarding them in the shops. Nearly every concern in town now have a few machinists at work. According to the statements of the strikers, 1000 men are still out.

A test case on the question of the rights of so called "pickets" resulted in a ruling by Police Judge Fiedler that pickets may be stationed around shops where non-union men are working and that these pickets are not to be molested by the police when they try to persuade men to leave their work, so long as there is no disorder.

At a meeting of union molders held last Sunday it was decided to defer action on their demand for \$3 per day until Thursday, although it had been previously decided to strike on Tuesday unless their demands were acceded to. In Cincinnati on Tuesday and Wednesday the National Founders' Association, through a committee, will confer with delegates sent by the molders' union. Thursday the local molders will take a day off and listen to the reports of the delegates to this meeting. If the report is favorable the men will return to work, but if otherwise, there will probably be a strike. The molders do not say so, but it is unlikely that any proposition to wait until July 1 before making the demands will be listened to. It is stated that several foundrymen, not members of the national association, have given their assurance that they will pay the scale, about 98 per cent. of the local molders are organized, the members of the union numbering nearly 900.

A Large Canadian Bridge Contract.

The Phoenix Bridge Company of Phoenixville, Pa., have received the contract to build the St. Lawrence River bridge at Quebec. The contract price will aggregate \$4,500,000.

The bridge will require 27,000 tons of steel. It will be 150 feet above the river, so that ships with the tallest masts can pass under it, and it will be 76 feet wide. It will be built in three spans, two of 600 feet each, and the center span 1800 feet. The middle span will be a cantilever, and will surpass the great span of the Tay bridge in Scotland by several hundred feet.

The bridge will contain four railway tracks, drive-

way, and walks on each side. It will take the Phoenix Bridge Company three years to turn out the structural material and erect the bridge, and in order to do the work much new machinery will have to be secured, and some of the shops will have to be enlarged and equipped for the work. In order to ship the structural material from Phoenixville to Quebec special cars will have to be made to hold the massive beams and girders that will be used in the construction of this great bridge.

Central Pennsylvania News.

HARRISBURG, Pa., April 30, 1900.—The high prices of the last few months have checked so many enterprises that the demand for the products of the various mills in this city and district has fallen far below the capacity of the mills to produce. All the managers of the various plants are endeavoring to see the hopeful side of the situation, but they admit that the deadlock between the buyers and the sellers is more serious than they apprehended at the opening of the year. Many of the manufacturers in this territory believe that a gradual reduction to a fair basis would be a good thing for the trade and result in a considerable enlargement of the volume before the summer is ended. They believe that there is nothing serious in the situation; that the summer will bring about such changes as must improve all lines of the iron and steel business.

James B. Bailey, president of the Chesapeake Nail Works, attended the convention of the cut nail manufacturers at Washington last Thursday, and it is believed that this convention will result in a better understanding with respect to this branch of the business. The heavy cut in the price of wire nails has caused a general disturbance of the market. While the Chesapeake Nail Works are as busy as usual at present, the officials do not take a roseate view of the outlook for the future. They think that the big drop in the price of wire nails is bound to affect the market for cut nails unless there should come an early upward turn in the wire nail prices.

The tin mills of Lalance-Grosjean Mfg. Company are now in full operation, but there is no assurance as to how long they may be kept going. The product of these mills is taken by the main plant at Woodhaven, L. I. Last year was the best in the history of the company. Larger dividends were paid than ever before, and orders were almost overwhelming. There was evidence of prosperity until about a month ago, when for some unaccountable reason there was a drop. The theory of those closely identified with the company is that stocks are full, and when prices recede to reasonable figures the demand will improve and business will gradually get better. Owing to the skyrocket prices last year foreign manufacturers were able to compete with the home market.

The South Harrisburg Chain Works are now in operation, under the direction of the consolidation of which they are a part. Chas. B. Stucker is the local manager.

The important improvements on the various steam and electric railways in this territory are making plenty of work for certain departments of the Pennsylvania Steel Works. The bridge and construction department is at work on a number of immense girders for the New York Central & Hudson River Railroad. These girders will weigh many thousands of pounds each. Every department of the works was in full operation last week, and all have large orders ahead. Certain departments are working day and night, and in some instances on Sunday in order to get through with a tremendous crush of important orders. During the last week almost a hundred new names were added to the list of employees.

S.

Information Wanted.—Who makes finished iron castings, useful in small mechanisms, such as small gears and dials for counters, ratchets, typewriter frame castings and the like? In the event of not finding parties equipped, our correspondent announces a willingness to purchase process complete for making aluminum, alloy and other castings on automatic machines.

The extensive and old established iron and steel works of Señores Duro & Co. of La Felguera, Asturias, Spain, have just been sold to a company formed with a capital of \$2,600,000, under the style of La Sociedad Anonima de la Felguera. The object of the new company is "to acquire more coal and iron ore mines, increase the output for exportation, erect a new system of furnaces and coke ovens, and develop to the fullest extent the manufacture of steel plates and merchant iron." For these additions and improvements a large amount of material and machinery will be required.

HARDWARE.

Condition of Trade.

THE steadiness which has characterized the market during the past week, notwithstanding the strain upon it by the radical reduction in the prices of Wire Nails and Wire, is an excellent indication of its strength. Both manufacturers and jobbers have pursued a conservative policy and refrained from making any serious break in prices, which, indeed, would not be justified in view of the cost of raw material and the higher wages which are in many cases being paid. Meanwhile the trade are buying these goods more freely than for some time, deeming them a safe purchase. Orders are in most cases for such quantities as will be required within a month or two, there being little disposition to buy speculatively. The possibility of an advance in the near future is recognized, but no assurance of this is given and the trade are exercising their judgment in regard to the matter. In any case it is not deemed likely that a large advance will be announced, and the possibility of a moderate advance does not offer sufficient inducement to place orders for goods which will not certainly be required in the near future. The jobbers are making request for allowances to cover their losses resulting from the sudden and sharp decline. Whether any concerted action of the same character will be taken by the retail merchants is not evident. The market continues to feel the effect of the break in Nails and Wire, and business between the manufacturers and the trade as well as between the jobbers and their customers has fallen off in volume as a result of the general distrust of the market. Very full and satisfactory advices on this point are, however, given in the special reports which follow from the leading trade centers. It is certainly a matter for congratulation that the market has held up so admirably under the strain to which it has been subjected, while the activity in business generally shows that the country is busy and prosperous. An important feature of the situation is the increasing foreign demand for not only finished goods, but also for raw material, and manufacturers in many lines are finding their export business rapidly developing and American goods taking a place of recognized importance in the world at large. The situation therefore presents many features which may be regarded with satisfaction.

Chicago.

(By Telegraph.)

To an appreciable degree the decline in Wire and Nails has unsettled the general Hardware trade, but only by way of arousing unrest and increased hesitation in the minds of buyers. The actual trade has suffered little, if any, for demands have been for many weeks confined to immediate needs. It is the common experience among jobbers that orders have been quite small, and this fact has created the general impression that the volume was in some way not what it should be. But footings give a sharp negative to these impressions. Taking the Hardware jobbing trade in Chicago in the aggregate, April was one of the best months ever experienced, both in value and in tonnage. The statement seems incredible in

view of the strikes and other obstructions to business in the West, and the fact leads to conjecture as to what the volume of business would have been had there been clear sailing. With favorable conditions one leading jobber remarks that his trade would have been double that for the same period last year. This state of activity, it is held, points to the remarkably prosperous conditions which from a commercial standpoint have taken possession of the Western trade. It would be difficult to specialize uncommon briskness in the Hardware market. All seasonable products are moving steadily and in goodly quantities. There is, on the whole, a uniformity to values which is explainable only by this rapid consumption of goods. Deliveries are in some instances delayed from factory, and concessions are merely the fortuitous happenings on the outskirts and not part and parcel of the market intrinsically.

St. Louis.

It does not appear that the recent reduction in Wire Nails and Wire has affected general trade to any extent. Some say that the reduction was too great to be taken as a natural trade condition, admitting at the same time that the range between Billets and Nails was at the old price too pronounced. The movement of Nails and Wire has not been materially greater than two weeks ago, at which time sales were shaping up nicely. In Shelf Hardware the volume of orders is very little below that last reported. There is, of course, the natural sloping off in buying usually had at this season. Builders' Hardware of finer grades is not finding much sale for local use, owing to continuance of labor troubles, but the cheaper grades are in fair demand. Country trade is in this respect in better action. The recent St. Louis merchants' trip through Missouri resulted in agreeable surprises to trade representatives, who found that crop prospects in the various localities were brighter than for some years and that local merchants in all lines were in anticipation of a resulting good trade. Manufacturers of Stamped and Pieced Tinware say they are not having the amount of business which should come in at this season. Retailers seem to be holding off in the hope of lower prices, but they are not likely to be had until raw material falls off in value.

Baltimore.

CARLIN & FULTON.—After prices of Wire and Wire Nails had reached figures which the American Steel & Wire Company by their recent action have demonstrated were both unwise and unnecessary, a gradual reduction in price might have been expected should genuine trade conditions favor the same, but the radical depreciation of every dealer's (wholesale and retail) stock of those commodities on April 21 was just about 75 per cent. more than the most knowing prophet could have predicted with any regard for his own reputation, especially as there had been no paralysis of trade, which alone could have justified such a reduction.

No one, from jobber to consumer, wishes the price of any commodity beyond the point at which it can be moved, and if the selling prices of Wire and Nails were such as to cause stagnation in those products it was only proper and right for the manufacturers to reduce them to prices at which they would move; but what the trade consider unjust is that during the whole month of April orders were solicited, accepted and shipped, up to the very day before the reduction, at the highest prices named since the existence of the trust, without one cent of rebate or allowance for stock on hand—nor even for

goods in transit. This is certainly unjust, for, when dealing with a monopoly, the average individual has little to base his actions or judgment upon except from the information given him by the corporation, and he is compelled to put faith in their statements or not deal with them at all. If Wire Nails were worth \$3.20 at Pittsburgh on April 1 there was certainly no cause for a reduction of \$1 on the 21st. If they were worth \$2.20 on the 21st they were surely not worth \$3.20 at any previous time that month, and it did not require three weeks' time for the factories to discover it. The regret at this extraordinary action of the Wire manufacturers is beyond the mere loss of a few dollars on a stock of Wire or Nails; it extends to the introduction into the Hardware and Iron trade of methods hitherto never experienced, and we are glad to say that these violent fluctuations have not been general.

Notwithstanding the tremendous advances that have occurred in raw materials since January 1, 1899, the market for general Shelf Hardware and Cutlery has been free from any unreasonable advance. We must remember that in 1898 prices were ruinously low, and, even without any extraordinary demand for goods or combination of interests into pools, trusts or combinations, a change was absolutely necessary for the preservation of our manufacturing interests. While during the year ending December 31, 1899, Foundry Pig Iron had advanced 116 per cent., Bessemer Pig Iron had advanced 142 per cent., Steel Billets had advanced 125 per cent., Wire Rods had advanced 143 per cent., besides the advances in labor, in lumber and in nearly every staple, manufactured Hardware has advanced only slowly, step by step, and with few exceptions over 50 per cent., while Cutlery has shown a very slight change, all showing the wisdom and conservatism of the average manufacturer.

The prices of to-day are in nearly every case legitimate and reasonable, and, in fact, were they based entirely upon the market price of raw material would be frequently higher.

The business of the country is generally excellent, as is shown by the earnings of the railroads, and only where prices have been forced foolishly and arbitrarily by pool or trust to figures which prohibit trade in such lines need the trade expect or fear any such radical steps as have just been taken in Wire and Nails.

Louisville.

W. B. BELKNAP & Co.—The absorbing topic of trade talk and newspaper comment the past week has been the precipitate action of the American Steel & Wire Company. We had been assured, not only by those in control, but by outsiders who did the philosophizing on the new order of things, that one of the beneficent results of the trust form of doing business was that when a declining market should prevail—if such a thing were possible—the descent would be made so gentle that we should never suspect ourselves on the toboggan except by the strictly pleasurable sensations engendered. To say that we have been rudely awakened would be to put it mildly. Is there any use of saying anything aloud, of making any sign except to hitch our waistband a little tighter and possibly curtail that summer trip? If we do not meet all of our Hardware friends at the Paris Exposition we shall know the reason why.

Louisville has been selected as the meeting place of the National Hardware Association's Executive Committee. Accordingly, May 7 will see that august body in session at the Galt House. A slight diversion to the Mammoth Cave is projected. Some of the members have expressed a desire to explore the bottomless pit first to see if any Wire or Nails are lodged therein. We shall feel it our bounden duty to advise *The Iron Age* of the result.

Cleveland.

THE W. BINGHAM COMPANY.—It was in December, we believe, just after the last advance on Wire and Nails,

for 1899, was made, that we stated in one of our letters to you, "The American Steel & Wire Company can drive their horse to water, but they cannot make him drink."

How true this has proven late developments in the Wire and Nail market will attest.

Consumers simply would not buy at the prices prevailing, and as the consumer, after all is said and done, is the fountain head of all business, the effect of their holding off was soon felt through the respective channels of, first the retailer, then the jobber, and, at last, the manufacturer.

What effect the recent heavy decline in prices will have still remains to be seen. So far, the orders have not been increased to any very appreciable extent, and we predict they will not until such time as the American Steel & Wire Company are willing to back up their prices, with a guarantee against a decline for a reasonable length of time, for jobbers, or retailers either, for that matter, do not care to have the price on their stock made a football for the purpose of Wall street speculating.

Trade, outside of Wire Nails, has been very good. While the orders are not large, they are quite numerous and cover a general variety, with perhaps season goods predominating.

New Orleans.

A. BALDWIN & Co.—Owing to the excessive rains in this whole Southern country business has been almost at a complete standstill for the past ten days. The greater part of the States of Texas, Louisiana, Mississippi and Alabama have been simply deluged with heavy rains, and it has interfered with the railroads to such an extent east of the Mississippi River that it has been almost impossible to get trains either in or out of New Orleans.

Even with these drawbacks business was becoming very quiet, owing to the uncertainty in regard to the general conditions. In the midst of this uncertainty the action of the American Steel & Wire Company in reducing the price on their product has had a tendency to almost demoralize what little business there was. It will require some little time to reassure country customers and considerable missionary work to induce them to believe that all product in the Iron and Steel line will not share the same unnecessary cutting as that made by the American Steel & Wire Company.

No estimate can be formed of the amount of damage done to the crops by these excessive rains, and time alone will tell the effect it will have on business for the next six months.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—It is some 16 or 17 years since the writer first met John W. Gates, and while recognizing at that time his ability and shrewdness, his action in making a reduction in price of Nails and Wire in the interests of the trade and his company, independent of Wall Street interests, stamped him a genius. What the so called "conservative element" can expect in trying to support a topheavy market in metals and products is beyond comprehension. The gamble is up, and we gamblers in the wholesale Hardware trade, who in the spring of 1899 bought a year's stock in so many lines, if we still have these heavy stocks on hand, with the experiences of the 70s, 80s, and 90s to guide us, deserve to lose, and lose heavily, as all gamblers are sure to do sooner or later if they do not give up the game. Our interests for months past have been to let those in control of the market carry the stock and take the chances. The high prices prevailing are and have been a menace for the past six months.

The practical workings of a trust can now be clearly seen in the American Steel & Wire Company. The 20 or 25 concerns comprising that trust would be competing and striving for tonnage, mills going, workmen employed, instead of being shut down with the complaint

of overproduction brought about solely by the effort to maintain an artificial price. We had a further example of the same working in the shut down of the American Tin Plate Company last winter.

Trade conditions in our territory show little change from those heretofore reported. We are just in receipt of first Government report regarding condition of crops, and find it to be very favorable on the whole. The drawback is the low prices prevailing for farm products generally.

Collections show no improvement; if anything they are slower.

Nashville.

THE GRAY & DUDLEY HARDWARE COMPANY.—The chief topic of conversation among the trade in this city for the past week has been the same one that is being so widely discussed all over the country—that is, the decline in Nails and Wire. It seems to be the general opinion that the prices of these commodities were too high, and that in the end it will be better for every one to have the goods at present prices, although the policy pursued by the American Steel & Wire Company in making this reduction does not meet with the approval of the trade.

The jobbers of this city have reduced their prices on Nails \$1 per keg, and on Wire 90 cents per 100 pounds, subject to stock on hand, and withdrawal at any time without notice.

The prices on other lines of goods so far have not been affected any, and we see no reason why they should be. Business generally is very satisfactory, and while orders are smaller and not so numerous as they have been, this is to be expected, as April is usually a rather dull month with us.

The volume of business for April of this year will compare very favorably with the corresponding month of 1899.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Since our last favor trade has increased considerably in activity. The opening of spring having been somewhat backward, the call for some kinds of season goods from the jobbing trade has been somewhat later than usual, therefore it appears to come upon us with a greater degree of force, and trade on season goods, like Garden Implements and so on and so forth, has been quite active the past two weeks.

The trade were taken amazingly by surprise April 23 upon being informed of the action by the American Steel & Wire Company in reducing the price of Nails and Barb Wire \$20 per ton. Referring to the telegram from *The Iron Age* asking our opinion whether jobbers would buy Nails and Wire more freely at new prices, we answered practically as follows: "We believe that after dealers have recovered from the surprise they may be inclined to purchase freely, as it is generally realized that the price on Nails and Wire is lower than the present basis of cost of billets would seem to warrant, consequently they feel comparatively safe from another stab in the immediate future. The trade feel that the unusual course taken on this line will have but little or no influence toward weakening prices on other lines of general Hardware. The columns of the public press have been more outspoken than individual merchants would have cared to have been regarding the actions of the responsible heads."

Although the above telegram was sent to *The Iron Age* six days ago, we have no reason to change our minds since that date. We think the uneasiness that was felt for 48 hours regarding what action manufacturers of other iron products would take has greatly subsided, and other manufacturers who have had their monthly or quarterly meetings since that date have confirmed former prices. This, we feel, was but natural, considering the present cost of pig iron and billets, and the extra wages which manufacturers have been compelled to give

at various dates during the past year was another barrier to any softening in general prices. The retail trade are buying very freely of both Barb Wire and Wire Nails; our record shows more Wire Nails sold during the past seven days to the trade than sold during the preceding month; in fact, we could say the past six weeks. This is a very convincing proof to us that the trade realize that the action is not likely to have an effect upon other goods, and are therefore not only willing to buy Wire Nails and Barb Wire at present prices, but are willing to continue their purchases for their wants without any uneasiness or fear. It would seem the last advance, and, we might say, the last two advances, on Wire Nails and Barb Wire could safely have been avoided and would then have been consistent with price of billets, and the sale on these two articles would not have diminished to the extent it has since January 1. Many customers of ours are like many customers of others, who have usually bought Barb Wire and Wire Nails in February and March, but had not bought during the time referred to beyond their immediate and daily requirements. We feel, however, the storm has passed, and what might have been a danger from the experiment of a sudden drop has been in this instance avoided.

There is one obstacle, however, confronts us—the product of the American Steel & Wire Company being sold at net 30 days or 1 per cent. discount if paid in 10 days. It is consistent with trade ethics to sell goods on the same terms that the jobbers are able to buy them, but the retail merchants do not take kindly to buying these goods upon 30 days, and if the jobbers are compelled to pay on 30 days and sell on longer time they are doing a banking business for their customers when they give longer time than they are compelled to pay for their purchases in and at manufacturers' prices. This 30-day business, therefore, continues a hardship on the jobbers, the retail trade and the consumers.

We regret to say that collections are not up to the usual average this time in the year.

Notes on Prices.

Wire Nails.—The trade have experienced no further sensations in the Wire Nail market since the announcement of April 21 of the reduction in price of \$1 per keg. Since the startling effect has worn off many look upon the result as not an unmixed evil. The large trade are placing orders quite freely for their prospective requirements, in view of a possible moderate advance in price. In fact, a noticeable increase in the number and size of orders from the trade in general has been a feature of the past week. The reduction is looked upon by some as a victory for the trade, as by restricting orders to their bare necessities they have caused the reduction in price. The American Steel & Wire Company are holding strictly to their announcement that the price is subject to withdrawal without notice, and is only for immediate specifications and prompt shipment. Quotations are as follows, f.o.b. Pittsburgh, terms 30 days or 1 per cent. off in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.22½
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

New York.—The trade tributary to this market are buying more freely since the reduction in the price of Wire Nails. Jobbers assume that increased orders indicate that merchants are stocking up to some extent. The market is firm at the following quotations:

To retailers, carloads on dock.....	\$2.53
To retailers, less than carloads on dock.....	2.66
Small lots from store.....	2.75

Chicago, by Telegraph.—Manufacturers report a doubling in the sales of Wire products this week, as compared with its predecessor. The same statement, in effect, is made from jobbing sources. One of the principal sellers here says the week just ended was the best in Nail sales

for the year, with the possible exception of the first week in January, immediately following the last advance, when attempted orders at the old prices were many. But the buying of Nails is mainly in small lots. The carload trade from Lake street does not compare with some former percentages. The interpretation is that dealers and consumers are ordering freely for their current needs, but are not speculating on the future course of the market. Quotation from store is \$2.53 for single carloads and \$2.60 for small lots.

St. Louis.—It is not seen that lower prices have caused an improved action in Nails. Sales were in good force several weeks ago, but even now orders placed in the past are being canceled. Prices are \$2.58, base, St. Louis, for single carloads; smaller lots, \$2.68, base.

Pittsburgh.—We are advised that at the lower prices for Wire Nails the trade are taking hold more liberally, and the movement of Nails has been larger since April 21, when the reduction was made, than for considerable preceding time. It is not believed that the price of Wire Nails will be advanced very soon, as it will probably be the policy of the American Steel & Wire Company to secure sufficient business to operate their mills in full before prices are advanced. The policy seems to be to fill the mills up at present prices if possible, in preference to running a few plants at high prices. The market is firm and we quote:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.22½
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

The above prices are for immediate acceptance and prompt shipment only, and are f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in 10 days.

Cut Nails.—At a meeting held on April 26, the Eastern Cut Nail manufacturers made the following prices, f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in ten days:

Carload lots.....	\$2.05
To jobbers in less than carload lots.....	2.10
To retailers in less than carload lots.....	2.20

These prices are subject to change without notice and only for immediate specifications and prompt shipment. It is safe to assume that Cut Nails will follow any changes made in the price of Wire Nails.

It will be noticed that the minimum carload price is now \$2.05, the price for 1000 kegs and over having been dropped. The present carload price of Cut Nails shows a reduction of 45 cents per keg, compared with previous quotations for largest lots. The differential between Wire and Cut Nails in largest lots was previously 70 cents, and is now 15 cents per keg. The Cut Nail trade has not had as long a time in which to consider the new situation, and orders do not show a corresponding increase with those for Wire Nails.

New York.—Prices of Cut Nails, embodying the reduction made by the Eastern manufacturers on April 26, are as follows:

To jobbers in carload lots on dock.....	\$2.23
To jobbers in less than carloads on dock.....	2.28
To retailers in less than carload lots on dock.....	2.41
Small lots from store.....	2.50

The local and nearby trade are buying in fair quantities.

Chicago, by Telegraph.—The new price established is \$2.40 for small quantities. The volume of trade has not undergone any noticeable changes, the product apparently having a distinct market of its own.

St. Louis.—A reduction of 50 cents is said to have been made by manufacturers, but jobbers have been holding at \$2.50, base. Sales in volume are about as usual, but present price is too close to that for Wire Nails to cause much discrimination.

Pittsburgh.—At a meeting of the Cut Nail Manufacturers' Association, held in Washington on Thursday, April 26, the price of Cut Nails was reduced as follows: Carload lots, \$2.05; less than carload lots to jobbers, \$2.10, all f.o.b. cars Pittsburgh, net cash 30 days, or 1 per cent. off for cash if paid within ten days from date of invoice.

The demand for Cut Nails is very light, but with this reduction in price it is hoped buying will be more liberal.

Barb Wire.—The reduction in the price of Barb Wire came too late to affect the spring demand to a great extent. The price is for immediate specifications and prompt shipments only, and subject to withdrawal without notice. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 30 days or 1 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.65
To jobbers in carload lots, Galvanized.....	2.80
To jobbers in less than carload lots, Painted....	2.67½
To jobbers in less than carload lots, Galvanized..	2.82½
To retailers in carload lots, Painted.....	2.80
To retailers in carload lots, Galvanized.....	2.95
To retailers in less than carload lots, Painted....	2.90
To retailers in less than carload lots, Galvanized..	3.05

Ellwood and Baker Wire is 5 cents higher, and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

Chicago, by Telegraph.—There is reported betterment in the Wire trade also. Orders for larger quantities are coming in from all parts of the West, the totals showing radical gains in comparison with late sales. Chicago delivery, single cars of Plain Annealed Wire, \$2.48; Painted Barb Wire, \$2.98; Galvanized Barb Wire, \$3.13, with 10 cents additional for small lots from jobbers.

St. Louis.—Small orders are coming in fairly well, but the demand on the whole shows no snap. Price for Painted in carloads is \$3.03; smaller lots, \$3.15, St. Louis, per 100 pounds. The advance on Galvanized is 15 cents per 100 pounds.

Pittsburgh.—The reduction made in price has, we are advised, stimulated demand for Barb Wire to some extent, and it is moving in larger quantities than for some time past. The market is firm, and we quote: Painted Barb Wire, \$2.65, in carload lots to jobbers, with an advance of 15 cents for Galvanized, all f.o.b. Pittsburgh; terms, 30 days or 1 per cent. off for cash in ten days.

Plain Wire.—The reduction in the price of Plain Wire has stimulated demand to a noticeable extent. Quotations for immediate specifications and prompt shipment, subject to withdrawal without notice, are as follows, f.o.b. Pittsburgh; terms, 30 days or 1 per cent. discount for cash in ten days:

	Plain.	Galvanized up to No. 14.
To jobbers in carload lots.....	\$2.15	\$2.55
To jobbers in less than carload lots....	2.17½	2.57½
To retailers in carload lots.....	2.30	2.70
To retailers in less than carload lots...	2.40	2.80

Galvanized Wire Nos. 15 and 16 is 75 cents advance on Plain, and Nos. 17 and 18 \$1 advance on Plain.

Pittsburgh.—Considerable Smooth Wire is being sold, and indications point to a much larger volume of business. We quote:

To jobbers in carload lots.....	\$2.15
To jobbers in less than carload lots.....	2.17½
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

Coil Chain.—A reduction of 25 cents per 100 pounds was made by the Standard Chain Company, Pittsburgh, April 25. The prices given below are for cask lots, less than cask lots being 40 cents per 100 pounds more and carload orders being 10 cents per 100 pounds less. The present prices for Proof Coil Chain in cask lots are accordingly as follows, f.o.b. Pittsburgh:

3/16	1/4	5/16	3/8	7/16	1/2 in.
\$3.50	6.60	5.60	4.75	4.60	4.50 per 100 lbs.
9/16	5/8	11/16	3/4	13/16	to 1 1/4 in.
\$4.40	4.30	4.25	4.25	4.15	per 100 lbs.

B. B. Chain, 1¼ cents per pound advance over Proof Coil.
B. B. B. Chain, 1¾ cents per pound advance over Proof Coil.
Twist Link, 3-16 to 7-16 inch inclusive, add ¼ cent per pound.
Twist Link, over 7-16, special price.
Self Colored, Long Link, Log Chain, same price as Common Coil.
Self Colored, Short Link, Long Chain, add ¼ cent per pound.
Bright Log Chain, add ¼ cent to Self Colored.

Builders' Hardware.—At a recent conference of the manufacturers of Builders' Hardware, at which sub-

stantially all the manufacturers were present, the business situation was carefully considered, both in regard to the condition of the market in the raw material and the character of the trade which is being done. The result was an agreement for the maintenance of existing prices. A feature of the situation, which tends to give evenness to the market, is that the various manufacturers identified with this large industry are more closely in accord than perhaps ever before.

Shovels and Spades.—An important meeting of the manufacturers connected with the Shovel Association is in session. One of the questions which will receive consideration is in regard to prices, there being an effort on the part of some of the manufacturers to have an advance announced. It is thought likely, however, that conservative counsels will prevail and that the requirements of the situation will be amply met by confirming existing prices. One of the arguments against making a reduction, which might, perhaps, on some accounts be justified, is that in the present condition of things it would have an injurious effect and tend to weaken the general tone of the market.

A matter of greater interest is the fact that negotiations which have been under way have resulted so successfully that the association has reached an understanding with almost all the outside manufacturers, according to which there is no danger to be apprehended from their competition. The concerns which have been in the field, or have been making preparations to enter the market, are the following: New Castle Shovel Works, New Castle, Pa.; Laughlin Nail Company, Wheeling, W. Va.; Baltimore Shovel & Mfg. Company, Baltimore, Md.; American Shovel & Stamping Company, Lorain, Ohio; Continental Tool Company, Frankfort, N. Y.; American Shovel Company, New Castle, Ind.; Havana Metal Wheel Company, Havana, Ill. The arrangements made with these companies are of different character. Some of them have been purchased outright or a controlling interest in them purchased by individual members of the association. Others for a consideration have agreed to abandon the manufacture of Shovels, or have otherwise been brought under association control. It is not stated, however, that terms have been made with Laughlin Nail Company, and it is believed that they remain independent of the combination. By this action the position of the Shovel Association is obviously greatly strengthened and they remain in practical control of the market.

Binder Twine.—Buyers are still backward about placing orders. Manufacturers are anticipating more of a demand when the nearer approach of harvest makes it imperative for dealers to have Twine to supply customers. The following quotations are made on Twine, f.o.b. New York, Philadelphia or Boston, with a reduction of $\frac{1}{8}$ cent per pound for orders less than a carload lot and over 10,000 pounds, and a reduction of $\frac{1}{4}$ cent per pound for carload lots:

	Cents.
White Sisal, 500 feet to pound.....	11 $\frac{1}{4}$
Standard, 500 feet to pound.....	11 $\frac{1}{4}$
Manila, 600 feet to pound.....	14 $\frac{1}{4}$
Pure Manila, 650 feet to pound.....	15 $\frac{1}{4}$

Glass.—As far as can be learned the joint session of the National Window Glass Jobbers' Association and the officers of the American Window Glass Company, held last week, was harmonious, and the only important business transacted was the acceptance of the option to purchase 500,000 boxes of Glass from the American Company. More particulars of the meeting may be available later, as they filter through. It is true that the American Company had a grievance against the jobbers' association for buying Glass of independents at a higher price than had been set by the company to govern such transactions. The American Company, however, forgave the erring jobbers, it is understood, and told them not to do so any more. It is stated that the jobbers' association wanted to contract for 700,000 boxes, but that the American Company would not agree to furnish more than 400,000, and to do this they would have to work a

month later than anticipated this summer and begin operations as early in the fall as possible. No change was made in prices. Eastern jobbers' prices for less than carloads are as follows: Single strength—First bracket, 85 per cent.; second and third brackets, 85 and 10; all above, 85 and 20. Double strength—First bracket, 85; second, third, fourth and fifth brackets, 85 and 10; all above, 85 and 20. Factory prices for carloads are as follows:

Single strength:	Per cent.
First bracket.....	85 and 25
Second and third brackets.....	89
All above.....	90 and 5
Double strength:	
First five brackets.....	89
60-inch bracket.....	90
70 to 100 inch brackets, inclusive.....	90 and 10 and 5
All above.....	90 and 20

Paints and Colors.—*Leads, &c.*—Labor agitations and high prices for building materials are affecting the demand for painters' materials, which has only been moderate all the spring in this section. The trade bought liberally in all lines during late fall and early spring in anticipation of higher prices. The demand for White Lead in Oil, while fair, is not up to expectations. Prices are without change, as follows: In lots of 500 pounds or over, 6 $\frac{1}{2}$ cents; in lots of less than 500 pounds, 7 cents per pound.

Bicycles and the Hardware Trade.

MANY Hardware merchants have handled Bicycles for several years with gratifying results, and conditions are now probably more favorable for others to take up this line than ever before. Prices are upon an equitable basis, and within reach of a large majority of people. The experimental period in the construction of Bicycles is past, models show but minor changes from season to season, and wheels to choose from, with enviable reputations, are numerous.

It is believed that the selection as agents by Bicycle manufacturers of irresponsible persons with no business standing or financial rating is practically a thing of the past. So anxious were makers to get their wheels on the market in the early years of the industry that many assumed risks which would now be considered suicidal. These irresponsible agents, many of whom carried their offices in their hats and had nothing to lose and everything to gain, were a source of great annoyance and a menace to responsible dealers who took up the sale of Bicycles. This is now changed. The Bicycle trade has settled down to a legitimate business basis, and from an uncertain venture wheels have become a recognized line which many merchants are handling. That they go well with Hardware is attested by the experience of enterprising merchants in all parts of the country.

Requests for Catalogues, &c.

G. H. HOPKINS has purchased the Hardware, Stove and Tinware stock of Morris Bros., Greenwich, Ohio, and will continue the business. Mr. Hopkins will appreciate copies of catalogues, &c., from manufacturers and jobbers.

Elderfield-Hartshorn Hardware Company, Niagara Falls, N. Y., have purchased the stock and good will of the Walker & Paterson Company of that city and will continue the business formerly carried on by that concern. The company will add very materially to the stock, and also put in an Electrical Supply department. They request copies of catalogues and discount sheets from manufacturers.

THE CHICAGO TIME REGISTER COMPANY, Chicago, Ill., have an interesting exhibit at the Paris Exposition, being located in the Furniture Building. They have recently appointed as their agents for France the Franco-American Company, 162 Avenue Parmentier, Paris.

THE MAKING OF A POCKET KNIFE.



OF the many millions of people in these United States who carry a Pocket Knife, there is probably not one in a thousand who have ever given a passing thought as to where the materials for its construction came from or with what care and labor it has been created. We are apt to take the things of every day use as we do the air that we breathe—they are here for our use and no questions asked. Through the courtesy of the Cattaraugus Cutlery Company of Little Valley, N. Y., we are enabled to lay before the trade the description given below, which shows to what extent the resources of old Mother Nature are taxed to bring forth a common Pocket Knife, like the one illustrated, and explains in detail the company's method of manufacture.

The steel for the blades of Cattaraugus knives is imported from Sheffield, England. The steel used in the springs, however, is American, and comes from Pittsburgh. Then, they must have German silver for the bolsters and brass for the lining of the Knife. Both of these metals are a combination of virgin metals, the German silver being composed of copper, nickel and zinc, and the brass of copper and zinc. These virgin metals are mined in our Northwest and from there taken to the mills in New England where they are made up into German silver and brass. If the company wished to make this same Knife up with an iron bolster they must then go to Sweden, where the best iron for this purpose is to be found.

We now have all the materials for the Knife except the cover. If we are to have an ebony handle we must get it from the island of Madagascar, where the best ebony is found. If we wish to put on a red handle we have our choice of California red wood or cocobolo. This latter can be obtained from Central America, or from nearly any of the tropical islands of the Pacific. For white bone or imitation stag handle we have to go to the great packing houses of the West where the cattle are made into beef and every part of the carcass is put to some use. For a genuine stag handle we have to go to Germany, where the stag horns from the great hunting preserves are each year gathered and sold. For a pearl handle we must go to the northwest coast of the island of Australia. For an ivory handle we must go to Central Africa, and for a shell handle we must go to the islands of the tropics, as it is there that the tortoise or sea turtle goes to deposit its eggs and is then caught by the natives and its shell sold to the traders.

In the process of construction the company have to use very largely of emery. This is an abrasive, and is found in several parts of the world, but that best known is from Turkey, where the rock is obtained, and is then taken to England, where it is crushed and put up for market, and it is from England that the company obtain it. The grindstones that are used are quarried in Northern Ohio and Southern Michigan. Some of the results of fishing expeditions are shown in the porpoise leather used on polishing wheels.

The Making of a Pocket Knife.

The first step in the manufacture of a Pocket Knife is the making of patterns from which tools are made. These tools consist of various dies and punches which are used in making the bolster blanks, linings, springs, blades and shields.

The dies are made of pieces of steel measuring about

$4\frac{1}{2} \times 3 \times \frac{3}{4}$ inches. A hole is cut in the center, the shape of the piece to be formed. The punches are made of steel about the same size as the dies, each being filed down so as to fit snugly into the die. These are used in a press, the die being set on the bed and the punch in the head of the press. It will be understood that when a sheet of metal is placed over the opening in the lower die and the punch brought down a blank is formed

of the exact shape of the die. In this way are made the scales, springs and bolsters, the small curved metal pieces, fastened at the ends of many Knives, between which on the side of the Knife is placed wood, horn, pearl or other substance. To construct a die for making these bolsters a piece of steel is formed into the exact shape of the bolster wanted. It is then hardened and is technically called a swedge.



Fig. 1.

A piece of steel $1\frac{1}{4}$ inches square, heated red hot, is placed on the bed of a large drop, then the swedge is placed on it as shown in Fig. 1. The hammer sinks the swedge into the red hot steel, leaving an impression of the bolster which it is desired to make, Fig. 2. This die is called a bolster boss, and is left in the drop press.

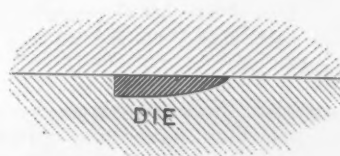


Fig. 2.

The bolster blanks from which the bolsters are made are pressed out of German silver or steel, through other dies made for the purpose. These bolster blanks are not as wide, but are a little thicker than the finished bolsters. One of them is illustrated in Fig. 3.



Fig. 3.

These blanks are placed in the boss, the making of which has been already described, one at a time, and are struck with a piece of steel $3\frac{1}{2} \times 1\frac{1}{4}$ inches, fastened in the large hammer, the face of the steel having a small hole drilled in it, so that when it strikes it a pin is formed on the flat side of the bolster. By means of this it is afterward riveted to the metal lining of the Knife.

One blow of the hammer makes the bolster blank fill the bolster boss, forming the completed bolster as shown in Fig. 4, the pin being on the other side of the bolster, and not shown in the cut.



Fig. 4.

The lining is made of a piece of silver, brass or steel, cut a little larger than its size when finished. One of these is shown in Fig. 5.



Fig. 5.

To this the bolster is riveted by the pin previously de-

scribed, when it presents the appearance shown in Fig. 6.

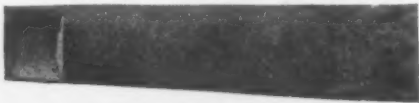


Fig. 6.

It is then pressed through a die which trims the edges, making all of the same kind exactly the same size. The result of this operation is shown in Fig. 7.



Fig. 7.

The springs are made of American steel of good quality, which comes in sheets 6 or 7 feet long by 16 inches wide. These sheets are cut crosswise in strips a little wider than the length of the springs. The springs are then shaped according to the die used. The spring is always kept parallel with the grain of the steel. This gives it greater strength and makes it less liable to breakage. The finished spring is illustrated in Fig. 8.



Fig. 8.

The greatest care must be taken in the making of the blades. These are forged from the best Sheffield steel, special pains being taken to prevent their becoming too hot, as this would change the quality of the metal. They are heated to a dark cherry red and then hammered precisely alike on both sides. The blades now appear as shown in Fig. 9.



Fig. 9.

After the blades leave the forgers they go to the grinders, who grind the scale off of the flat sides of the tang, leaving a smooth surface, where the name of the Cattaraugus Cutlery Company is stamped. Each blade is then filed where it leaves the tang. They next go to the men who harden and temper them. This is the most particular part of the making of a Knife, and requires much skill and experience. The company warrant all blades against being tempered too hard or too soft. After tempering the blades go to the grinders, where they are ground on common grindstones which run in water to keep them cool and so not altering the temper of the blade. The ground blade is illustrated in Fig. 10.



Fig. 10.

The woods used in making the handles of Knives are principally ebony or cocobolo. They come in logs about 7 feet long by 1 foot in diameter and are sawed into pieces of the right size. Shell coverings are sawed out of tortoise shell just as it comes from the animal's back. Buffalo covering is cut out of the tips of the horns. Pearl, bone and stag coverings are sawed into

proper shape by the firms from whom they are purchased.

The materials necessary for making all the parts of the Knife are counted out in lots of from six to 1000 dozens at a time, and given to men who make the Knives. Boxes with plates for each pattern are furnished the cutler. The boxes are made out of hard wood about $4\frac{1}{2} \times 2 \times 1$ inch and are used to hold the metal lining with bolster attached as described above while it is being drilled. Holes are countersunk into the top of the box so that the bolster fits into them, and the piece of metal is held in place by steel pegs set around it. The plates are made of steel the same shape as the lining with three holes in them. The metal to be drilled is placed in the box, with a plate on top, and is drilled through the holes in the plate. These holes are the ones through which rivets pass, fastening the blades and springs in the Knife as well as holding the Knife together. The holes which are drilled in this operation are shown in Fig. 11.



Fig. 11.

The linings are then dished on the front side, making the covering fit snug to the edge. The ends of the covering are then matched on a wheel to fit the bolster. Then it is drilled and riveted as shown in Fig. 12.

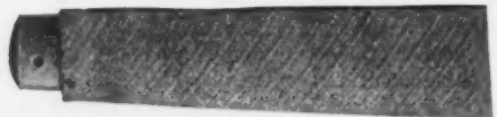


Fig. 12.

The edges of the covering are then ground down to the metal lining, which leaves them ready for shielding, as shown in Fig. 13.

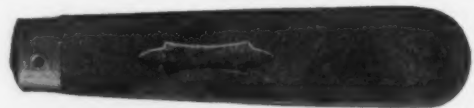


Fig. 13.

The drilling out of the hole for the shield is done by putting the scale on a block and placing a plate over it with a hole in it the same shape as the shield to be used. These are fastened together in a vise and the holes are drilled out by means of two slim bits about 12 inches long. One end is fastened into a wooden spool, the other is flattened and filed sharp and has a shoulder on it. This stops the drilling when the shoulder strikes the shield plate. These two bits are placed in the hole of the shield plate; the other end working in a breast plate, is operated by a man holding in his right hand a stick about three feet long with a cord running once around the wooden spool and fastened at each end of the stick, making a bow drill. After the hole is drilled out, Fig. 13, the shield is put in and held by wire rivets, Fig. 14.



Fig. 14.

The holes in the bolsters are countersunk, making it possible to get a good rivet head when the knife is put

together and rendering it impossible to pull the pins, as can be done in many of the Knives with hollow bolsters.

The cutler takes the springs and marks them with a dot punch where he wants the holes drilled. The holes are then drilled as marked, Fig. 15.



Fig. 15.

The ends of the spring are next filed to pattern, thus making every spring for the same kind of Knife the same length. The springs are then gathered in bunches of about three dozen each and strung on a wire passing through holes which have already been drilled. In this form they are heated over an open fire and tempered in oil. After this each spring is straightened with a hammer. The insides and ends are glazed and polished on wheels with leather heads set up in emery.

The blades are marked and drilled after each tang is filed to a pattern. This is very particular work and has to be done with great accuracy so that the joints of the Knife shall be right. The edges and sides of the tang are polished, which operation must be done before the blade is put into the Knife.

The different parts of the Knife are now ready for assembling. After this is done and riveted the handle and blade backs are next finished on wheels set up in different grades of emery and on cloth buffs, which give the handles a glossy finish. The Knives now pass to the inspector, who looks each Knife over very carefully to detect any flaws or imperfections, such as are occasioned by poor workmanship, or to find broken scales. The Knives now pass on to have the blades polished, glazed and colored on leather wheels set up with very fine emery, the finer polish being given with a crocus. All pocket blades are whitened on very hard grindstones, which gives a smoother surface to finish and a finer edge.

When the blades are finished the company's trademark or a customer's name is etched on the blade. This is done by transferring ink letters from a copper plate to the blade to be etched. The blade is then covered with a kind of varnish and the ink letters are washed out with turpentine, leaving the steel bare where the letters stood. Acid is then applied which eats the letters into the blade.

Great care is taken to send out Knives with keen, sharp edges. These are obtained by the use of very fine hones in the hands of workmen who have had years of experience in honing Knives. When the blades are properly honed the Knife is cleaned inside, the blades wiped off and shut down. Then they are buffed on a cloth wheel, which gives the handles a very bright and glossy



Fig. 16.

finish. They are next wiped off, wrapped in paper and boxed ready for the market. Fig. 16 illustrates a completed knife.

The Business of the Company and How It was Founded.

J. B. F. Champlin, the president and founder of the Cattaraugus Cutlery Company, was born and raised on

a farm in the town of Napoli, Cattaraugus County, N. Y., 6 miles from the present location of their factory. In the year 1853 he made his first start as a traveler by going to Philadelphia with a drove of cattle, and in the following spring going to Venango County, Pa., for a drove of sheep. These two trips, in all probability, laid the foundation of and shaped his career in after life, as it demonstrated to him that the world was larger than he could see from the top of the old hill on which he was born. And, although he tried to make a living from the farm, it was not a success. He also worked in the lumber woods and was known at one time as the best ox teamster on the Allegheny River. He still had a liking for trade and the road, and at odd times managed to make enough on the road to offset what he lost on the farm. He finally concluded to rent his farm and spend his entire time as a professional commercial tramp.

Mr. Champlin's first connection was with Peck &



J. B. F. CHAMPLIN.

Seymour of New York, and his first trip was made in a suit of bagging which he had fashioned and made himself. His samples were thrown together in a half bushel basket, and his appearance contrasted oddly with that of the well dressed agent of that day or the up to date drummer of to-day. In the line carried by Peck & Seymour were the samples of the product of two small factories, and it was here that he developed and showed his ability as a Cutlery man, as he soon sold more goods than the firm could produce. He then took the sale of Cutlery for N. F. Thorpe, a small jobber, of 296 Pearl street, New York, for whom he traveled for a number of years. Through Thorpe he took a line of Silver Ware made by Rogers & Bros. of Waterbury, Conn. This touch with the Silver Ware trade brought him in contact with Simpson, Hall, Miller & Co. of Wallingford, Conn., for whom he afterward sold goods for many years.

About this time he met J. C. Friedmann of the firm of Friedmann & Lauterjung, then of 30 Barclay street, New York, and formed an acquaintance that terminated in what was perhaps the longest engagement ever made in the Cutlery business, as Mr. Champlin agreed to work for Friedmann & Lauterjung for 15 years, and fulfilled the contract by working 16 years and 6 months, selling mainly German Pocket Knives and Scissors, English Razors and American Table Cutlery and Shears.

The system of making goods in small factories under strange brands in Solingen, Germany, had so reduced the quality of the German Pocket Knife that he concluded to drop German goods and sell American solely. He was surprised to find that he could not secure a situation with any first-class American Pocket Knife manufacturer at

a reasonable salary or commission. However, having lots of energy and many personal friends among the trade, and a few thousand dollars which he had saved, he took the sale of the goods manufactured by the Central City Knife Company, then a new and rather weak concern, and by sheer force he had their goods well established in a single year. The concern had then grown to such magnitude that they thought they could hold the trade without the salesman, and this connection was severed. Then Mr. Champlin and his son, Tint Champlin, formed a jobbing business of their own, which soon terminated in the Cattaraugus Cutlery Company, who built their own factories and are to-day known from ocean to ocean. Mr. Champlin undertook the selling of the goods, and for years placed the major part of the entire product, establishing trade for other salesmen and moving to the front. "Old Man Champlin," as he was called on the road, had a very large acquaintance and many personal friends in the Hardware trade, and, although now retired, or, as he terms it, reformed, he yet likes to join one of the company's salesmen on a trip, and always gives him a good lift in orders.

The company began to do business in a small way, having about 30 operatives. Their factory was very small, and their office and shipping rooms covered a floor space of about 800 square feet. The territory then covered consisted of New York, Pennsylvania and Ohio. They had at that time five or six traveling men, but Mr. Champlin sold the bulk of the product. The business has gradually grown until now they have a large and commodious factory plant, its several buildings covering nearly 2 acres, the office and shipping rooms a floor space of more than 10,000 square feet, and having in their employ nearly 200 operatives. The company now cover every State in the Union and have 20 representatives on the road.

They sell their product exclusively to the retail Hardware trade. During last year they built a large addition to their buildings, to enable them to increase their product, but the rush of their business has so steadily kept up that with all their increased facilities they find themselves as badly behind on orders as they were a year ago at this time, and are now getting material on the ground to still further enlarge their factory, and will in the near future give employment to at least 100 more men.

The Fly from the Business Viewpoint.

BY AN OBSERVER.

THOSE who, during the winter months, have found it profitable to speculate upon the causes and correction of the frosting of show windows, and have wondered why some merchants are constantly troubled by this annoyance while others enjoy practical exemption from it, may profitably turn their attention to another and even more serious problem, imminently seasonable—the fly nuisance.

Why is it that some stores are fly infested, from the first warm week of spring to the first hard frost which ushers in the winter, while to other stores in the same city or town, and often in the same neighborhood, the fly is only an occasional visitor? It is easy to understand why as between a grocery and a Hardware store, the fly should show a decided preference for the former. He would be a fool if he did not, and the fly is no fool, so far as those who suffer from his attentions are able to judge.

We can also understand why he should lie awake nights to devise expedients for getting into a delicatessen dispensary, and should develop exceeding cleverness in inventing ways and means of evading expulsion therefrom. It is not so clear, however, why the discriminating fly should manifest a decided preference between stores which contain nothing eatable, and which, apparently, are good places for him to keep away from. But

the fly has views of his own on many subjects, and since we cannot follow his lines of reasoning we are left to speculate why it is that flies congregate in some stores, hold conventions on the ceiling, play tag in the air, examine everything shown a customer before he has time to look at it; sit on the counter and watch him like department store detectives on the outlook for shop lifters; organize conspiracies in restraint of trade by spoiling goods and driving away customers, and generally behaving as if they were working an aggressive boycott; while from other stores selling like goods they keep away so obligingly that only an occasional fly tramp, probably for some reason *persona non grata* to his kind, will drift in, feel lonesome and drift out again at the first opportunity. One needs to know a great deal about flies, and to have a much closer insight into their habits and characteristics than can be gathered from casual observation, to answer this question intelligently and with the conviction that he has solved the problem to his own satisfaction and the advantage of those for whom it has a very practical business interest.

However regarded, the fly nuisance is a serious matter for merchants who suffer from it, and it invites something more useful than playful discussion. Not only is the fly capable of injuring a great deal of stock if he gives his mind to it, but he can, and does, make some stores so disagreeable that customers are driven away. A fly blown stock is always unattractive and suggests the idea that it has been long on hand. A fly laden air is a torment to one who comes to buy, and makes him wish he had gone elsewhere. The presence of flies in large numbers creates the vague suspicion that the place which so attracts them cannot be clean and wholesome, and that if it did not offer them some special inducement to stay they would not waste their time loafing around it. This view, which may seem to do the principal victim great injustice, is in some degree warranted by the fact that there is a reason for everything, even for the marked preferences manifested by the fly for one place over another apparently no more attractive. To discover the reason for this discrimination, and to correct the causes which explain it as far as may be possible, will pay any merchant thus troubled.

We offer as a serious suggestion, worthy of thoughtful consideration, that in towns having local trade associations this subject be taken up for investigation on scientific and business principles. There are learned entomologists who know a great deal about flies, and who have had very little opportunity thus far to make their knowledge useful. To employ these wise men to investigate and report upon the causes and correction of the fly nuisance in stores where no apparent inducements are offered them to come or to remain, would cost much less than the results of their investigations would be worth. For example, some years ago the orange growers of Southern California were troubled with what was believed to be a disease of this fruit, known as rust. The skin was more or less completely covered with reddish brown stains, resembling rust on iron, and this promised to destroy the orange industry by making the fruit unsalable. The growers, through their organization, applied to the Department of Agriculture in Washington for the services of an expert, and an entomologist was sent to see what could be done about it. A thorough microscopic investigation showed that rust was not a disease of the fruit at all, but the work of an insect which attacked the skin of the orange and stung it. The next question was how to get rid of this troublesome insect. Its habits were studied, resulting in the interesting discovery that the harmless lady bug (*coccinella apidiphagi*) was the natural enemy of the rust insect, as it is of the hop louse, and that if lady bugs were more plentiful the rust insect would have to emigrate. So lady bugs were cultivated and turned loose, the rust insect was eaten or emigrated and the orange crop saved.

This shows that what are often regarded as investigations of abstract scientific interest are capable of being

turned to very practical account when opportunity is offered. The house fly has a record beginning with Egyptian papyrus—his pedigree has been taken, and a great deal more is known about him than those not specialists in entomology have any idea of. There are a great many clever people, reachable through the Smithsonian Institute, who, if any one saw fit to turn the knowledge they have, or could acquire, to practical account, could set the fly guessing what he had "come up against." He has had his own way so long that like the beggars of Munich before Count Rumford's time, he has grown reckless and intolerable. It is quite probable, however, that he could be much more easily stampeded or suppressed than is generally supposed. To many merchants the knowledge of how to get rid of him would be worth a great deal of money annually, and it would be good business policy to undertake the investigation of the fly nuisance in a sincere and purposeful way with the beginning of the fly season, which, long as it is, is none too long for conclusive experiments.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

The Break in Wire Nails.

The radical reduction in the price of Wire Nails, Barb Wire, &c., continues to be a prominent topic of discussion in the trade. Relating to it we have the following from a Southern house:

Was the recent sensational cut of \$1 per keg in Wire Nails wholly necessary?

Why should a corporation adopt a measure so drastic as to be sure to cause demoralization?

That a reasonable reduction was in order can forcibly be seen from *The Iron Age* of April 19, in their reports from the retail Hardware merchants of different States. Out of 73 different reports, 37 distinctly mention the fact that sales of Wire and Wire Nails had fallen off from 25 to 100 per cent., because the price was too high.

The other reports, while not specifically mentioning any particular article, doubtless also referred to the same goods as having affected sales.

Yet would not a gradual reduction (say 25 cents every ten days) have as well resulted in reviving the trade in these lines, and at the same time enabled the merchant to work off stock at about cost instead of a loss?

Sensational declines are talked of on every street corner, and with lightning rapidity are known in every village and hamlet, while a moderate reduction would take the usual slow routine in getting to the ear of the consumer.

The A. S. & W. Company are hardly acting in good faith to the jobber in adopting such measures, and in fact the whole transaction smacks too much of stock jobbing to be healthy from a business point of view, and such methods should be strongly condemned. So emphatic should be the protests that repetitions will be few and far between.

THE SWEDISH RAZOR COMPANY, Worcester, Mass., whose factory was recently damaged by fire, advise us that it is now in complete running order. The company took advantage of this opportunity to remodel their plant and to add to its equipment, so that they are now prepared to turn out their well-known Razors in larger quantities than ever before. They refer particularly to the uniform good quality of their product; their Razors being hardened and tempered by thermometer, thus insuring absolute evenness. Their line is described as very large, and especially adapted for the Hardware trade, and is guaranteed.

Hardware Organizations.

Western Washington Hardware Association.

A MEETING of retail Hardware merchants, situated in the western part of Washington, was held in Seattle on the 19th ult., at which an association under the above name was organized. Merchants from nearly all the larger towns of Puget Sound were present. The principal object of the meeting was to form an organization for the protection of the trade against jobbers who also do a retail business and expect the exclusive retailers to patronize them. Another object was to protest against the exorbitant freight rates charged by the railroads on less than carload lots.

At the forenoon session after considerable discussion a committee was appointed to draw up resolutions covering these abuses, and at the afternoon session the resolutions were unanimously adopted.

The following are the officers of the new association: E. C. Adams, Port Townsend, president; Henry Moore, Tacoma, vice-president; C. J. Reckers, Seattle, secretary, and N. H. Thedinga, Seattle, treasurer. These officers, with George B. Green of Thorp, comprise the Executive Committee. The next meeting of the association will be held November 2.

New England Hardware Dealers' Association.

The monthly meeting and dinner of the New England Hardware Dealers' Association will be held on Wednesday, May 9, at the United States Hotel, Boston. The subject for discussion will be the report of the committee on the "Relations of Manufacturers of Builders' Hardware with the Retail Trade, Consumers, Builders and Architects." During the evening the proceedings will be enlivened with some character songs, rendered by Robert L. Van Buskirk and Waldo R. Blackmer.

Associations of Hardware Merchants.

IN view of frequent inquiries from the trade for this information, we give below a list of the State retail Hardware associations of the country, supplemented with a few important local organizations in large cities. The names of the secretaries of the associations are also given.

This list will be of general interest as showing the extent to which the organization of the retail trade has thus far been carried, and will be of special interest to any Hardwaremen who, having conceived the idea of starting associations in unorganized States, may desire to communicate with the officers of established associations for suggestions as to the proper course to pursue.

CHICAGO RETAIL HARDWARE DEALERS' ASSOCIATION, G. R. Lott, secretary.

CLEVELAND RETAIL HARDWARE ASSOCIATION, F. C. Thornton, secretary.

DETROIT RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION, Fred. H. Cozzens, secretary.

EAST TENNESSEE HARDWARE ASSOCIATION, W. A. Jones, secretary-treasurer, Greeneville, Tenn.

ILLINOIS RETAIL HARDWARE DEALERS' ASSOCIATION, Lewis M. Reeves, secretary, Peoria.

INDIANA HARDWARE ASSOCIATION, M. W. Robb, secretary, New Harmony.

INTERSTATE RETAIL HARDWARE DEALERS' ASSOCIATION, R. F. Berry, secretary, Bloomington, Ill.

IOWA RETAIL HARDWARE DEALERS' ASSOCIATION C. W. Brelsford, secretary, Villisca.

KANSAS RETAIL HARDWARE DEALERS' ASSOCIATION, J. A. Cole, secretary, Topeka.

MICHIGAN HARDWARE ASSOCIATION, Fred. H. Cozzens, secretary, Detroit.

MINNEAPOLIS RETAIL HARDWARE ASSOCIATION, C. F. Stremel, secretary.

- MINNESOTA RETAIL HARDWARE ASSOCIATION, Thomas McCracken, secretary, Minneapolis.
- MISSOURI RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION, E. Thomas, secretary, Trenton.
- NEW ENGLAND HARDWARE DEALERS' ASSOCIATION, James A. Farless, secretary, Boston.
- NORTH DAKOTA HARDWARE ASSOCIATION, C. N. Barnes, secretary, Grand Forks.
- NORTHWESTERN RETAIL HARDWARE ASSOCIATION, Thomas McCracken, secretary, Minneapolis, Minn.
- OHIO HARDWARE ASSOCIATION, Geo. M. Gray, corresponding secretary, Coshocton.
- OREGON AND WASHINGTON RETAIL HARDWARE DEALERS' ASSOCIATION, H. K. Brown, secretary, Portland, Oregon.
- PACIFIC RETAIL HARDWARE ASSOCIATION, Robert W. Boyd, secretary, Marysville.
- RETAIL DEALERS' HARDWARE AND IMPLEMENT ASSOCIATION OF TEXAS, James G. Blaine, secretary, Taylor.
- ST. LOUIS STOVE AND HARDWARE DEALERS' ASSOCIATION, A. F. Geschwinder, secretary.
- WESTERN WASHINGTON HARDWARE ASSOCIATION, C. J. Reckers, secretary, Seattle.
- WISCONSIN HARDWARE ASSOCIATION, C. A. Peck, secretary, Berlin.

Experimentation With Railroad Fencing.

FROST WIRE FENCE COMPANY, Cleveland, Ohio, have been investigating the fact that Railroad Fence Wire rapidly deteriorates where strung along the track, in consequence of the action of sulphurous smoke, &c., from the fuel consumed in the engines. The problem is to furnish a quality of Galvanized Wire for fencing, particularly railroad fence, proof against corrosion and rust. The company advise us that they have experimented largely to make a satisfactory quality of Galvanized Wire for their Woven Fence trade, and to their surprise found that the Wire with the least coating of spelter gave the best satisfaction. The reason assigned for this was that heavily coated Wire would scale or peel in the process of weaving through fence machines, thereby leaving the Wire entirely unprotected in spots.

It is asserted that in recent years manufacturers of Wire have cheapened its cost very often at the expense of quality, but it is admitted that the Woven Wire Fence manufacturers themselves are largely to blame for the thinly coated Galvanized Wire furnished, as a result of which much complaint is heard of woven fences, particularly those containing small, light Wires, which rust out. No other result, it is pointed out, could be expected where the Wire was insufficiently galvanized or merely washed, and the company believe that until manufacturers of Woven Wire Fence so construct their looms as to avoid twisting and crimping the Wires (which always peels the spelter) so as to enable the Wire manufacturer to heavily galvanize, nothing different can be expected.

On account of the reasons recited above the Frost Wire Company have for the present given up the idea of producing a factory made Woven Fence, preferring to construct upon the field, thereby avoiding the abuse given the Wire in passing through weaving machines, as now constituted, which enables them to use heavily coated Galvanized Wire, and furnish the trade with a quality of fence which, when properly constructed, it is claimed, will give many years of service.

The road master of one of the railroads giving particular attention to this matter gives as his experience that the weakest fence of which he has any knowledge when free from corrosion and rust had ample strength to resist stock. The manager of the railroad department of the Frost Wire Fence Company believes this statement is warranted, but thinks the railroad people will agree that the small Wires are always the first to give way, and until, as is suggested, the scientist is successful in being able to increase the life of Fence Wire, manufacturers of Fencing must make the best of existing conditions, which seems to be by using larger sizes of Wire.

The point is made that it does not necessarily follow that increasing the weight of Wire in a fence will greatly increase its cost. By the use of large sizes of Wire the spacing can be so arranged as to get satisfactory results without adding much to the cost, while posts can be set much further apart with a rigid, heavy Wire fence than is possible with a light Wire fence, thereby effecting a saving.

The company believe, taking into consideration cost of fence, cost of posts and setting them, durability, &c., that the fence containing all heavy Wires will be found to be the cheaper in the end.

Warner & Rucker.

WARNER & RUCKER is the name of a partnership just formed at 88 Chambers street, New York, succeeding Norman Warner at the same address, who for two years has been carrying on a similar business as manufacturers' agent. Norman Warner was for 13 years with Russell & Erwin Mfg. Company, New York, and Banks Rucker for five years traveled for them in the Southwest. They represent the following houses in New York City and State and in the New England States—viz., Thomas Devlin & Co., who operate and control the National Hardware & Malleable Iron Works, National Specialty Mfg. Company, and Philadelphia Hardware & Malleable Iron Works, making a varied line of Hardware. They also represent in the same territory Southern Tack Company, Braunsdorf-Mueller Company, Taintor Mfg. Company and Brohard Company, to which they contemplate adding a few more desirable accounts. They have two entire floors, and carry a stock of all the goods they deal in from which to fill immediate orders.

The Washburn Wire Company.

THE Wire plant of R. H. Wolff & Co., Limited, of New York City has been acquired in the interests of the Washburn Wire Company, which will soon assume the management of the business.

R. H. Wolff will continue with the new company. C. E. Terry, for a long time associated with Washburn & Moen Mfg. Company, and more recently with the American Steel & Wire Company, will have charge of the selling department. This is one of the best equipped plants in the country, and has for years been favorably known for the fine quality of its product, which consists of high grade Wires.

The factories of R. H. Wolff & Co., Limited, are located at the foot of East 117th and 118th streets, New York, on the Harlem River, and have wharf facilities directly connected with the factory buildings.

The Wire Rods used will, for the time being, be bought either in this country or in Europe, but the Washburn Wire Company expect, within a few months, to make Steel and roll Rods.

The manufacture of Wolff-American Bicycles, which has heretofore been very successfully conducted by R. H. Wolff & Co., Limited, will be continued under that name. The Wire business will be transferred to the Washburn Wire Company. Meantime it will be conducted under the name of R. H. Wolff & Co., Limited.

Freeman, Delamater & Co.'s Catalogue.

FREEMAN, DELAMATER & CO., Detroit, Mich., have just issued a fine new catalogue of 1129 pages, each 11½ x 8¾ inches, showing a very complete line of general Hardware and allied goods of which they are wholesalers. It includes Farm Implements, Well Supplies, Plumbers' Goods, Refrigerators, Edge Tools, Cutlery, Builders' Hardware, Scales, Sporting Goods, Silver Plated Flat Ware, Bicycle Parts and Accessories, Guns, Revolvers, House Furnishing Goods, Tinners' Tools and Machines, &c. This catalogue is the first they have issued, and was compiled in their own office by their own force, a fact in which they take considerable pride and with good reason. In the book they have endeavored to make the descriptions throughout as simple, complete and explicit as possible. The various lines of goods illustrated are grouped and arranged in a convenient and systematic manner, enabling a person with a little familiarity with the catalogue to find the particular article desired without the aid of the index.

Price-Lists, Circulars, &c.

RHODE ISLAND PERKINS HORSE SHOE COMPANY, Providence, R. I.: Catalogue of Perkins Horse and Mule Shoes and Toe Calks. The company state that they are now making several new sizes and have otherwise improved several patterns to conform with the most modern ideas on shoeing.

VARIETY MACHINE COMPANY, Warsaw, N. Y.: Elevators and Elevating Machinery. A folder illustrates their Belt Power Elevator, Hand Elevator, Power Attachment for Hand Elevators, Carriage or Wagon Ele-

vator, Floor or Sidewalk Hoist and Automatic Self Sustaining Dumb Waiter.

UNION CYCLE MFG. COMPANY, Highlandville, Mass.: 1900 catalogue showing Union 1900 Road Racer, list \$50; Union Whitehead, list \$50; Union Redhead, list \$40, and Union Chainless, list \$60.

NARRAGANSETT MACHINE COMPANY, Providence, R. I.: As a temporary catalogue the company have issued a collection of illustrations with accompanying descriptive matter. These sheets relate to a large line of Lockers for schools, gymnasiums, offices, factories, clubs, armories, &c.; School Wardrobes, Racks, &c. The company are also manufacturers of Gymnastic Apparatus, Playground Apparatus and Bowling Alleys, and expect to issue a complete catalogue before very long.

THE DICKE TOOL COMPANY, Downers Grove, Ill.: Catalogue of Electric Linemen's Construction Tools and Hardware Specialties.

GILBERT & BENNETT MFG. COMPANY, 44 Cliff street, New York: Catalogue No. 147, Eastern Edition, illustrating Wire Goods in various forms, Netting, Fencing, Wire Cloth and Wire Work.

CHISHOLM & MOORE MFG. COMPANY, Cleveland, Ohio: Illustrated catalogue of Pneumatic and Hand Power Traveling and Jib Cranes, Pneumatic Riveters, Chippers, Drills, Calkers, &c. The company also show Door Hangers, Pulleys, Elevator Locks, Standard Rail Joints and a line of Railroad Specialties.

WILSON BOHANNON, 754-776 Lexington avenue, Brooklyn, N. Y.: Illustrated catalogue of patent bronze metal spring Padlocks, Combination Drawer Locks, Combination Chest Locks, Key Drawer and Chest Locks, Tubular Rim Night Latches, Mortise Night Latches, Rim and Mortise Store Door Locks, &c.

CLINTON WIRE CLOTH COMPANY, Clinton, Mass., and 76 Beekman street, New York: Condensed catalogue illustrating Electrically Welded and Woven Wire Fence and Hexagonal Netting. This company also manufacture Wire Cloth, Wire Lath and Perforated Metals of all kinds.

NEY MFG. COMPANY, Canton, Ohio: Illustrated catalogue and price-list No. 17. The goods shown include Overhead Track, Hay Carriers, Track Trimmings, Carrier Accessories, Hay Forks, Slings, Pulleys, Hoists, Wire Stretcher, Hay Knives, Lawn Rake and Lawn Mowers, Tiling Shovels, Post Hole Digger, Harness Hooks, Barn Door Latches, Pulls, Bolts and Catches, Sash and Stay Rollers, Barn Door Hangers, Hooks, Hasps and Staples, &c.

LALANCE & GROSJEAN MFG. COMPANY, 19-21 Cliff street, New York, pamphlet of Cooking Utensils, made of Agate Nickel-Steel Ware, showing some of the staple lines.

Trade Items.

HEWYWOOD BROS. & WAKEFIELD COMPANY, Gardner, Mass., announce that the constant growth of their Time Recorder Department has made it advisable to separate it entirely from their regular Chair business. An arrangement has accordingly been made whereby they have sold to the Simplex Time Recorder Company, also of Gardner, all their rights, patents, &c., in the Time Recorder business. The latter company announce that they are now located in new and commodious quarters, and are better fitted than ever to attend to the orders of the trade.

THE BRONSON COMPANY, Cleveland, Ohio, were succeeded April 1 by the Bronson-Walton Company, who will continue the manufacture of Coffee Mills with increased capital and facilities for prompt shipment of goods. After May 1 the office and factory will be at 1800 East Madison avenue, near the Nickel Plate railway. The None Such and Ever Ready Coffee Mills will be made with important improvements in design and construction, and new patterns of Mills will be added in the near future. The company will be glad to quote prices at any time on high, medium or low priced Coffee Mills.

ALEXIS WITTE, 47 Warren street, New York, manufacturer of Razors, Razor Handles and other Cutlery, has been obliged by the increase of his business to move to 81 Warren street, where he has the first and second floors above the street. This new arrangement will give him increased facilities for manufacturing as well as more accessible and commodious quarters. The first floor will be used for office, sample and stock rooms, and the floor above for manufacturing.

CHARLES J. GODFREY, 11 Warren street, New York, dealer in Bicycles, Guns, Ammunition and Sporting

Goods, has moved across the street to No. 6, into the premises recently occupied by the Liberty Cycle Company, who have secured other accommodations in the same building.

ALFRED H. SMITH, formerly at 131-133 Duane street, New York, is now located at 84-86 Chambers street, in the same quarters as formerly occupied by Wiebusch & Hilger a year or so ago. He imports a large line of Toilet Brushes of every description for the hair, teeth, cloth, &c., from England, France, Germany and Japan. He also represents exclusively in the United States one of the best German factories.

GRAY & DUDLEY HARDWARE COMPANY, Nashville, Tenn., who are now erecting one of the finest establishments in the country, have placed a \$7000 order for the Warren patent Hardware Shelving, made by J. D. Warren Mfg. Company of Chicago. The entire first floor of the establishment, which is 55 x 255 feet, will be equipped with this Shelving. The J. D. Warren Mfg. Company are naturally proud of this large order, which with the heavy run of other orders, gives them all the work they can conveniently handle.

W. R. WALKLEY of the Peck, Stow & Wilcox Company, New York, has been persuaded by the officials of that company to reconsider his resignation tendered about two months ago on the occasion of his election to the presidency of the reorganized H. D. Smith Company, Plantsville, Conn., who manufacture high grade Carriage Forgings, and all kinds of special Drop Forgings. He has resigned his office in the H. D. Smith Company, and severed all connection with that concern, and will continue as heretofore with the old company, with whom he has been identified since their incorporation November 1, 1870. Winfield D. Walkley, formerly with Peck, Stow & Wilcox Company, continues as vice-president of the H. D. Smith Company, with office and sample room in the Postal Telegraph Building, 253 Broadway, New York.

MILLER BROS. CUTLERY COMPANY, Meriden, Conn., in removing their New York office, managed by L. A. Lightfoot, from 332 to 309 Broadway, in the Mutual Reserve Building, have also arranged to show a full line of their Pocket Knives at this branch in addition to Steel Ink Erasers and fine Steel Pens, of which they are large manufacturers. They make upward of 60 patterns of Pens, and illustrate 22 styles of Steel Ink Erasers. To more thoroughly introduce the Pens they are now mailing to bookkeepers, &c., nine distinct patterns in a neat wood slide cover box free of charge.

In his advertisement in this issue Frederick W. Silliman, successor to S. Silliman & Co., Chester, Conn., calls attention to his line of patent wood Inkstands, Pocket Inkstands, Barrel Traveling Inkstands, Pounce Boxes, Sand Boxes, Letter Stamps, Seals, &c. Mr. Silliman also makes Tool Handles and is in a position to do special wood turning.

WICKWIRE BROS., Cortland, N. Y., manufacturers of Wire Cloth, Nettings and Wire Goods, are installing a continuous Rod mill plant, built by Morgan Construction Company, Worcester, Mass.

In the advertisement of the American Bicycle Company, Waverley factory, Indianapolis, Ind., in our last issue the address of their New York office was incorrectly given. It should have been 941 Eighth avenue. At this plant, it is interesting to note, the company are making the Waverley Electric Vehicles, comprising 18 models, from a Two-Passenger Runabout to a Nine-Passenger Break, all guaranteed mechanically and electrically. The company contract to maintain battery for five years.

STANDARD CHAIN COMPANY, Pittsburgh, Pa., in their advertisement on another page, call attention to the fact that they are manufacturers of Chain of all kinds, including Hardware, Railroad, Marine and Foundry Chain, and Agricultural and Wagon Chains. In this connection the reduction in the price of Coil Chain, announced under the head of Notes on Prices, will be of special interest.

THE AMMUNITION MANUFACTURERS' ASSOCIATION have removed to the new Vincent Building, 302 and 304 Broadway.

THOMAS F. KEATING, who for about 30 years has been identified with the Yale & Towne Mfg. Company, has disposed of his interests in the company and terminated his connection with them, and opened an office at 23 Warren street, New York. As a result of this long and prominent connection with the trade Mr. Keating has an exceptionally thorough and practical knowledge of matters concerning Builders' Hardware and its related branches, and a wide and influential acquaintance who will wish him success in his new departure. Mr. Keating is one of the founders of the Hardware Club and has been its treasurer from the first.

Among the Hardware Trade.

James R. Sager has sold out his interest in the business of the C. H. Sager Hardware Company, Lebanon, Ill., but no other change has been made. The firm are looking for an excellent business during the present year, in view of the good prospects for large grain and fruit crops.

Fred. C. Scott, who has been in the Hardware business at David City, Neb., for the past 13 years, has admitted a partner and the style is now Scott & Medinger.

A. B. Miller is successor to Stafford & Lee, at Riley, Kan., retailers of Hardware and Agricultural Implements.

Mr. Noble retired from the wholesale and retail Hardware and Mill Supply firm of Gladwin & Noble, Westfield, Mass., on the 1st ult., and Mr. Gladwin is now sole proprietor of the business.

J. P. Conley, Hardware, Stove and Farm Implement merchant, New Cumberland, Pa., expects soon to commence the erection of a new store.

F. L. Smith has lately embarked in business in Oswego, N. Y., handling at retail Shelf Hardware, Furnaces, Fishing Tackle, &c.

S. L. Bacon has succeeded Bacon Bros., Gettysburg, S. D., dealers in Hardware and general merchandise.

T. H. Davy has disposed of his interest in the Fort Collins Hardware Company, Fort Collins, Col., to A. F. Brown. The company advise us that there is every prospect of a prosperous year's business.

The Hardware business of Crouse & Leonard, Stephenville, Texas, has been sold to the Higginbotham Company, general merchants. Mr. Crouse will hereafter probably devote his attention to the cattle business, but Mr. Leonard will identify himself with the Higginbotham Company as manager of the Hardware department of their establishment.

H. C. Heldt has purchased a half interest in the Hardware, House Furnishing, Building Material, Buggy and Furniture business of W. T. Creek, Oakland City, Ind., and the style became April 1 Creek & Heldt. The business, already an extensive one, will be conducted on a still larger scale than heretofore in the large and well equipped store room recently built and owned by Mr. Creek.

Copper City Commercial Company, a branch of the Hennessy Mercantile Company, Butte, Mont., have purchased the Hardware stock of the Anaconda Copper Mining Company, Anaconda, and will continue the business at the old stand.

Birkmayr & Rodemich Bros., Toledo, Ohio, have closed a contract for the large double store 408 and 410 Summit street. The firm expect to be in their new quarters by June 1. The building is four stories and basement, 40 x 120 feet, and will be fitted up in convenient and attractive style. It will be completely overhauled, new freight and passenger elevators constructed, and a handsome new front put in on the second floor. This front will be in the nature of a bay window and will afford excellent opportunities for display. The first floor will be occupied as a general salesroom and will be finished in oak. The second floor will be occupied entirely by the firm's stock of Stoves. The third floor will be devoted to Wooden Ware and Refrigerators, and the fourth floor to stock and storage. This important change was made necessary by the increasing trade of the firm, and in the new quarters they will be able to give more attention to the jobbing side of their business, which covers Michigan, Indiana and Ohio, and Western Pennsylvania and New York.

Griffin Hardware Company, Rome, Ga., who commenced business November 1, 1899, finding it necessary to double the capacity of their warehouse, are erecting a new building adjoining the old, the dimensions of which are 40 x 200 feet. The business of the house since starting has been far beyond their expectations, and the future outlook, they say, could not be more favorable.

The Sweetser-Sanborn Company, successors to E. A. Tibbets & Son, Somersworth, N. H., have been incorporated with a capital stock of \$8000. Chas. E. Sanborn is president of the company and Arthur I. Sweetser clerk and treasurer. The company will carry on the wholesale and retail business in Shelf and Heavy Hardware,

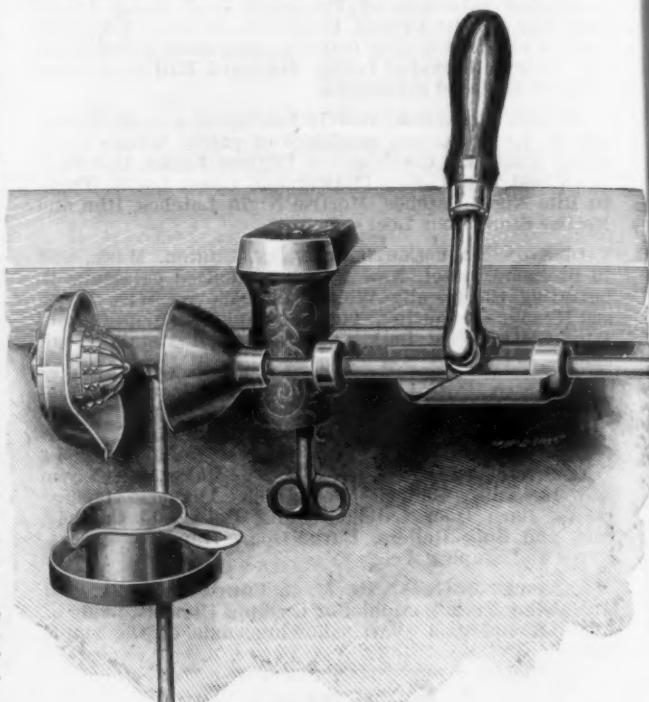
Agricultural Implements, Manufacturers' Supplies, &c. They intend to enlarge their stock and also contemplate putting in new store fixtures.

Scythes.

Indiana Edge Tool Company, Gas City, Ind., who are manufacturers of a line of agricultural edge tools, are expecting to be in a position to put some scythes on the market during the present month. The company will make entirely hammered scythes.

Champion Lemon Squeezer.

The Arcade Mfg. Company, Freeport, Ill., are offering the lemon squeezer herewith illustrated. It is provided with aluminum holder, plunger and receiver, and is referred to as being finely finished, highly polished and nickel plated. Among the advantages claimed for the squeezer are the following: That no part of the frame projects above the level of the bar to interfere with the operator, that it will successfully squeeze the largest or smallest lemon and extract all the juice, that it has great power, that it is easily and quickly operated, that the plunger rests in a socket and can be readily taken



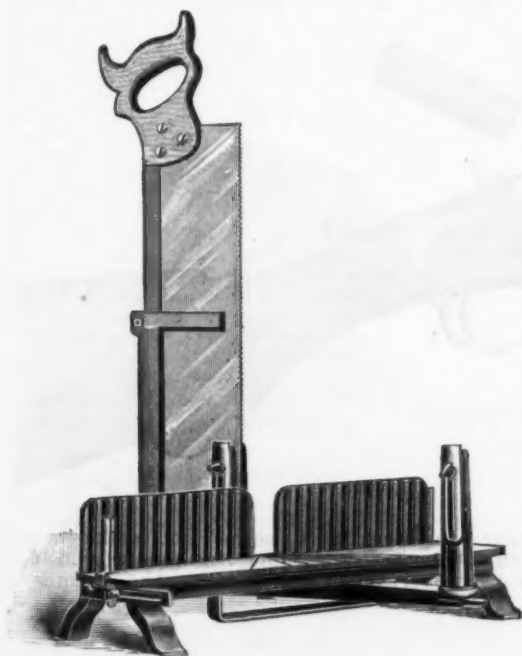
Champion Lemon Squeezer.

out for cleaning, and that it is provided with an adjustable cup holder, so that a full sized lemonade tumbler can be used if desired. The squeezer is quickly attached to the bar by turning the thumb screw. Charles C. Naret, 59 Park place, New York, is Eastern representative for the company.

Babst's Perfection Miter Box.

The miter box here illustrated is put on the market by Chas. Babst Company, Naperville, Ill. The bed of the box is of 2-inch stuff, to prevent warping or splitting. Bolts pass through the wooden bed, the iron frame and legs, to hold all firmly together. A stiff oil tempered plate spring on the swinging lever holds the stop catch firmly in the angle notches on the semicircle, and added to this, it is explained, a wide bearing of the lever on the semicircle with the pressure of the spring bar underneath, assures absolute rigidity of the lever. This, it is pointed out, is important, as the swinging lever is the backbone of the miter box, being the receptacle of the guide and saw, so that upon the lever depends the accuracy of the saw. It is stated that the spring being confined, will never get weak, will always hold up firmly and take up any wear on stop catch. The box is provided with adjustable angle arms, which do not extend out from the box, and not being in the way, are less liable to be broken off. Emphasis is placed on the desirability of the saw guide. It is pointed out that having a large bearing surface it holds the saw firmly, obviating all swaying; that with this guide more accurate cut is possible, with rapidity and ease of operation, and that it is attached or detached easily and quickly. When

not in use the saw is raised, with the guide, in a perpendicular to allow access to material and freedom of both hands to handle it. The miter box takes in stock

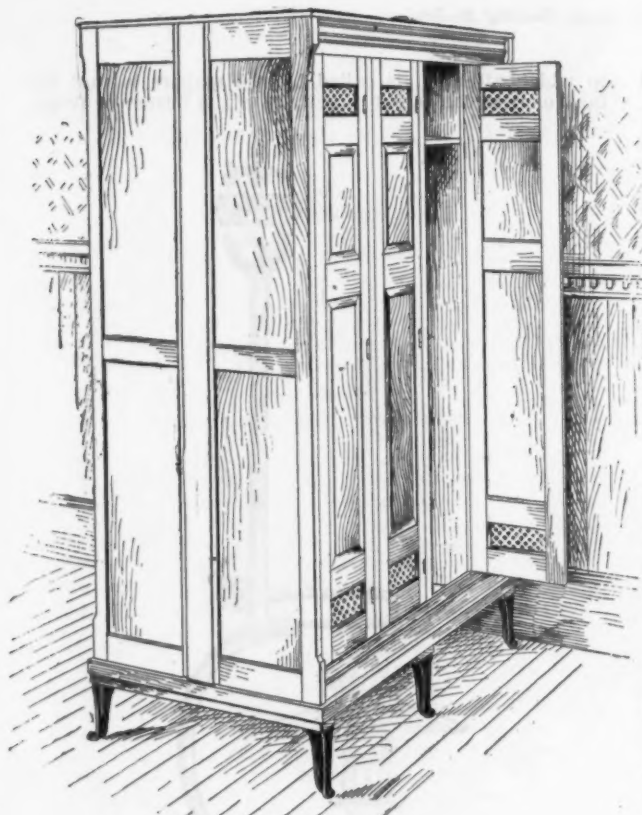


Babat's Perfection Miter Box.

8½ inches at right angle, and 5½ inches at miter. The box is referred to by the manufacturers as having few parts, as heavy and strong and as well finished.

Standard Locker 98.

The Narragansett Machine Company, Providence, R. I., are offering the 98 Standard locker, shown in the accompanying illustration, for shop and factory use. It



Standard Locker 98.

is built of white wood throughout, selected for outside work, with doors having raised panels and ventilator

grates built in. It is finished with one coat of shellac inside and two outside, rubbed between coats. The locker is 12 x 12 inches in size, 5 feet high, which has been found a desirable size for factory use, being tall enough to hold coats. Sometimes the lockers are ordered with inclined tops, to prevent articles being piled on the top of the locker, also with slotted bottoms that allow dirt from overshoes, &c., to sift through. The galvanized iron bottom used on the company's school lockers is referred to as accomplishing a similar result. A large variety of styles of lockers are manufactured by the company, who remark that probably no single combination can be made that will be suitable in all cases, but that selections can be made that will suit any case. We are informed that the company have recently furnished a manufacturing company 300 lockers like the one illustrated, and that another company have been provided with 40 of another style for their office. A shipment of still another style of locker has just been sent to Germany for an American firm. The company are designing a locker to go on the wall over benches, for use in old shops where provision cannot be made for separate wash rooms. The company are prepared to receive plans of any room, suggest arrangement of lockers, and make prices on any quantity, either erected in the building or f.o.b. Providence.

Japanese Fiber Broom.

The Osborn Mfg. Company, Cleveland, Ohio, are offering the broom shown in the accompanying cut. It is made of split bamboo, or, as the company term it, Japan-



Japanese Fiber Broom.

ese fiber, being a stock which they import from China for this particular purpose. These brooms are referred to as being much the same in appearance as a heavy corn broom, although, it is stated, they are manufactured on a new principle and are much stronger, so that it will be impossible for this broom to ever work loose on the handle. This, it is explained, is owing to the peculiar and improved method of constructing the inside part of the broom. Besides being sewed with the strongest and best twine, it is stated, the broom also has a heavy wire band. The company are of the opinion that the broom possesses all of the good points of a corn broom for mill and warehouse use, and for all other plain, coarse sweeping, such as connected with stables, railroads, docks, &c., and, in addition, that it will last much longer and will keep its shape, instead of curling over and getting lop sided, as is often the case with corn brooms. The same broom made with a mixture of rattan through the center is especially designed for very heavy sweeping. The brooms are all put up in bundles of one dozen each, each bundle being put into a cloth sack, to insure their reaching the purchaser in good condition.

A New Single Shot Gun.

Harrington & Richardson Arms Company, Worcester, Mass., are putting on the market the automatic ejecting

which carries with it a proper amount of oxygen to the burner, which, in connection with the mantle, produces an incandescent effect. The manufacturers state that one of the important features of the lamp is the gen-



Fig. 1.—A New Single Shot Gun.

single gun shown in the accompanying cuts. It is referred to by the manufacturers as high grade in every respect, and as selling at a low price. The gun is now

erator being over the flame and not coming in contact with the burner or gasoline, the generator being supplied by a very small stream of gasoline. Another point



Fig. 2.—Frame of Gun Cut Away, Showing Mechanism.

made in 12 gauge, with plain steel and twist barrels, 30 and 32 inch. The standard finish is case hardened frame, hammer and trigger, with blued guard, the gun being fitted with a heavy butt plate of handsome design. The gun is of the "take down" variety, the barrel being easily and quickly separated from the frame, it is remarked, by taking out the hinge screw. This requires no tools, a lever being arranged in a simple and effective manner. The lever does not project above the surface of the frame when closed and, it is pointed out, neither detracts from the appearance nor interferes in handling. In Fig. 2 the frame is shown cut away to expose the mechanism, and in this connection the makers refer to the gun as the embodiment of strength and simplicity. The automatic mechanism which throws the shell clear of the gun and the lock mechanism are covered by letters patent. All other springs, with the exception of the trigger spring—which has but a slight movement—have been superseded by coil or helical springs, thus reducing the breakage, it is remarked, to a minimum. This feature, it is said, has heretofore been applied only to high price shot guns. The hammer is rebounding, actuated by the main spring through the medium of the main spring guide, which has two differential bearings on the hammer.

to which attention is called by the makers is that the tank or reservoir is not directly over the burner or flame,

The Brilliant Gas Lamp.

The accompanying cut represents an incandescent gasoline gas lamp, put on the market by the Brilliant Gas Lamp Company, 42 State street, Chicago, Ill. The lamp is made entirely of brass, except the generator, and is finished in oxidized copper, nickel plate and polished brass. The generator is in return form, U shaped, and gets, it is pointed out, double the amount of heat, as the heat strikes it in two places. The curved pipe is filled in part with fine wire or cable, so that the gasoline is partially checked in its flow and divided into numerous fine streams. There is also a small gas chamber which regulates and prevents back pressure, and forces, it is explained, a fine stream of gas into the intake pipe,

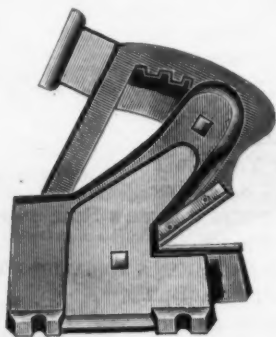


The Brilliant Gas Lamp.

consequently there is no danger from its becoming overheated.

An Improved Shear.

Bicknell Hardware Company, Janesville, Wis., are offering an improved form of shear, as shown herewith. It is made in sizes No. 1 and 2, the No. 1 cutting flat iron $\frac{3}{4}$ x 3, and round iron up to $\frac{3}{4}$ inch. No. 2 cuts $\frac{1}{2}$ x 4 flat iron, and round iron up to $\frac{3}{4}$ inch. Each shear is provided with a gauge for holding flat and



An Improved Shear.

round iron, and requires but one man to operate in cutting light or heavy bars. We are advised that the manufacturers are now building a full line of combined and separate punches and shears, splitting shears, emery grinders, power boiler feed pumps, &c.

Stratfold Garment Hanger and Stretcher.

Berclay Mfg. Company, 256 West Twenty-third street, New York, are making the Stratfold clothes hanger, here illustrated. Fig. 1 shows the hanger, Fig. 2 indi-

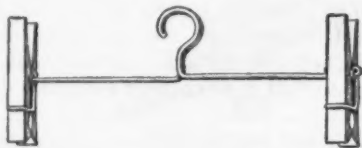


Fig. 1.—Stratfold Garment Hanger.

cating the method of using it. It is designed for garment hanging and stretching, and is made in 8, 10 and 12 inch sizes for suspending trousers, skirts, &c. Where space

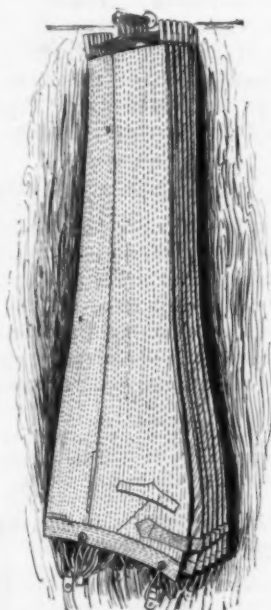


Fig. 2.—The Hanger in Use.

is limited from six to eight garments can be suspended from one hook or rail, it is said, thus largely increasing wardrobe and closet capacity. It suspends skirts in smooth, natural folds, and preserves the crease and re-

moves the bagginess in trousers. Some of the advantages to which the manufacturers draw attention are that it saves pressing, doubles available closet space, makes trousers and skirts hang right, prevents wrinkling and sagging and can be quickly adjusted to the garment.

CONTENTS.

	PAGE.
The Pawling & Harnischfeger Crane Works. Illustrated.....	1
The Occurrence, Treatment and Application of Graphite.—II.....	3
The Paris Exposition. Illustrated.....	6
The British Iron and Steel Institute.....	9
The Bliss Straight Sided Wiring Press. Illustrated.....	9
The Becker-Brainard Vertical Spindle Milling Machine. Illustrated.	10
Pennsylvania Engineering Works.....	11
The Oliver 20-Inch Hand Jointer. Illustrated.....	13
The New Eight-Hour Bill Favored.....	13
The Gurney Wood Pulley. Illustrated.....	14
The National Tube Company.....	14
Dean Bros. Steam Pumps of New Patterns. Illustrated.....	15
Chester Notes.....	15
The New Columbus Blast Furnaces. Illustrated.....	16
The Truscott Propeller Wheels and Motors. Illustrated.....	18
The National Enameling & Stamping Company's New Mills.....	18
Pacific Coast News.....	19
The Maywood Stand Molding Machine. Illustrated.....	20
The National Association of Manufacturers.....	21
Concessions in Freight Rates.....	22
Editorials:	
The Index Supplement in Practice.....	23
Congressional Action Relative to Porto Rican Corporations.....	23
The Consular Service.....	24
The Canadian Calamity.....	25
British Iron Trade Statistics.....	25
Correspondence.....	25
Canadian News.....	26
Obituary.....	27
New East River Bridge.....	28
Personal.....	28
Cement Construction.....	28
Manufacturing:	
Iron and Steel.....	29
Machinery.....	29
Armor Plate Steel for Locomotives.....	29
The Iron and Metal Trades:	
A Comparison of Prices.....	30
Chicago.....	30
Philadelphia.....	31
Cleveland.....	32
Pittsburgh.....	33
Cincinnati.....	34
St. Louis.....	34
Birmingham.....	35
The Belgian Iron Market.....	35
New York.....	36
Metal Market.....	36
Iron and Industrial Stocks.....	37
The New York Machinery Market.....	38
The Boston Machinery Market.....	39
The American Sheet Steel Company.....	40
Harnessing Lake Superior.....	40
The Cleveland Labor Situation.....	41
A Large Canadian Bridge Contract.....	41
Central Pennsylvania News.....	41
Information Wanted.....	41
Hardware:	
Condition of Trade.....	42
Notes on Prices.....	44
Bicycles and the Hardware Trade.....	46
Requests for Catalogues, &c.....	46
The Making of a Pocket Knife. Illustrated.....	47
The Fly from the Business Viewpoint.....	50
Letters from the Trade.....	50a
Hardware Organizations.....	50a
Associations of Hardware Merchants.....	50a
Experimentation with Railroad Fencing.....	50b
Warner & Rucker.....	50b
The Washburn Wire Company.....	50b
Freeman, Delamater & Co.'s Catalogue.....	50b
Price-Lists, Circulars, &c.....	50b
Trade Items.....	50c
Among the Hardware Trade.....	50d
Scythes.....	50d
Champion Lemon Squeezer. Illustrated.....	50d
Babst's Perfection Miter Box. Illustrated.....	50d
Standard Locker 98. Illustrated.....	51
Japanese Fiber Broom. Illustrated.....	51
A New Single Shot Gun. Illustrated.....	52
The Brilliant Gas Lamp. Illustrated.....	52
An Improved Shear. Illustrated.....	53
Stratfold Garment Hanger and Stretcher. Illustrated.....	53
Publishers' Announcement.....	54
Current Hardware Prices.....	55
Current Metal Prices.....	62

Publishers' Announcements.

The Knight of the Grip.*

THIS book is a reprint of the series of articles bearing the above title which were originally published in *The Iron Age* and attracted much attention. In view of their prominent interest and their suggestiveness they have been issued in this form.

On account of the character of its subject matter this book will perhaps be specially interesting to traveling salesmen, but will also be of interest to the employers of the salesmen, and to the merchants with whom they are in constant contact. The employer cannot fail to find in it many suggestions in regard to the success of salesmen on the road and the treatment which should be accorded to them. In a similar way the narration of personal experiences and the discussion of the different subjects covered by the volume will be of interest to merchants, by whom many hints in regard to business matters may be gathered from its pages. The successful merchant usually knows the value of the services of commercial travelers and finds the Knights of the Grip, as a rule, an important source of information in regard to what is going on, while in many cases they are held in high regard for their excellent judgment in business matters and their personal character and worth. The book is clear and forcible in its style, and pervaded by a kindly and genial spirit. It shows the hand of one who is thoroughly familiar with the subject of which he writes, and at the same time is a keen observer, with a happy vein of humor and sometimes of pathos. There is not a page where the interest of the reader flags.

To the traveling man, of course, the work especially appeals, as it recounts the experience of successful and unsuccessful traveling salesmen, and indicates qualifications which, if not essential to the success of a man on the road, are valuable aids. As stated in the preface, "The book is not intended to instruct. There is not a word of advice in it. It is not humorous. . . . If it has any merits it lies in the fact that it treats of a lot of rattling good fellows, and contains the honestly recorded impressions of a dozen years of intimate association (of the author) with them. Every incident is from life."

No one salesman has been selected as a model embodying in the greatest degree the good qualities of the commercial tourist, not because of any lack of material, but because the dozen or so of men who came to the mind of the author in this connection exhibit so many varying and often contradictory traits of character and temperament, and such radical differences of manner and method, that any attempt to find a standard type would have been futile.

The book treats the traveling man, as a class, on a broad basis, bringing out his condition, character and conduct, with incidents based on actual experiences, and description of the methods pursued with buyers of the various types with whom he has to do. It is thus not only a readable book, but contains also much that is suggestive to those who are looking for the secret of success on the road. Some idea of the scope of the book and the many topics treated may be obtained from the headings of the 33 chapters into which the book is divided:

HIS POSITION IN THE TRADE.
A COMPANIONABLE FELLOW.
WHEN HE PASSES.
THE SYNDICATE SALESMAN.
THE PACE THAT KILLS.
TEMPTATIONS.
THE MANUFACTURERS' SALESMAN.

*The Knight of the Grip. Reprinted from *The Iron Age*. 170 pages. Bound in cloth; price by mail, postpaid, 60 cents. David Williams Company, 232-238 William street, New York.

PERSONALLY REPRESENTED.

SALESMAN AND BUYER.

FRICTION.

SOCIABILITY WITH BUYERS.

MANY MEN OF MANY MINDS.

THE VETERAN.

GENTLEMEN ALL.

TIME KILLERS.

THE WOMAN IN IT.

A TALE OF A TILE.

THE SALESMAN AND THE OFFICE MAN.

WIDE AWAKE.

OFF THE ROAD.

TREATING OF VARIOUS THINGS.

THE JOBBER'S SALESMEN.

THE FIELD OF THE JOBBER'S SALESMAN.

THE RETAIL TRADE.

THE JOBBER'S SALESMAN'S RELATIONS TO HIS HOUSE.

THE SALESMAN IN A RUT.

MONEY MATTERS.

LOYALTY.

THE BUYER OUT.

OTHER HINDRANCES.

SAMPLES AND THEIR VALUE.

JUDGMENT AND DISCRETION.

KINDNESS, COURTESY, CONCLUSION.

While the book is written from the viewpoint of a Hardwareman, and has throughout a Hardware atmosphere, there is no reason why it should not be interesting and useful to merchants or Knights of the Grip in other lines of business.

The tendency of the book is elevating, but without moralizing, and treats in a dignified way the position and work of the Knights of the Grip, who occupy so important and so honorable a place in the commercial field.

The chapters are short enough to be read at odd moments, or between stations, and the book is of convenient size to find a temporary lodgment in the coat pocket.

The initials and tail pieces at the beginning and end of each chapter, respectively, portray familiar scenes in the daily experiences of a drummer's life.

An Appendix gives some letters from merchants and travelers in which some phases of the general subject are discussed. Among these are:

THE OLDEST HARDWARE TRAVELER.

THE VALUE OF A BUYER'S TIME.

THE VETERAN TRAVELER?

FROM AN OLD HARDWARE TRAVELER.

WHAT THE TRADE SAY ABOUT TRAVELING SALESMEN.

TRAVELERS CAN GIVE MERCHANTS POINTERS.

A RETAILER'S DAY WITH THE KNIGHTS OF THE GRIP.

THE IRON AGE INDEX SUPPLEMENT.

With this issue is sent out a new edition of The Iron Age Index Supplement, representing the great variety of products of the advertisers in *The Iron Age*.

As indicating the usefulness of the last edition of the Index Supplement to manufacturers, railroad purchasing agents, as well as merchants at home and abroad, we append the following extracts from letters relating to the matter:

The trade will certainly appreciate this very good Index you have gotten out. It will be of great benefit, we have no doubt, to many of them.

So far as we have examined it it is a perfect Index, and will prove a great convenience.

We find the Index a very complete and accurate classification of the products of the Iron, Hardware and Machinery trades, and we value it very much indeed. We appreciate it very highly.

We desire to express our appreciation of *The Iron Age* Index Supplement. We find it to be an extremely useful work in assisting us to make up our stock book, the classification of products in our line being just what we need, and saving us much valuable time. It is a work which we will have in daily use.

Current Hardware Prices.

REVISED MAY 1, 1900.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Cut Prices.—In the present condition of the market, while many advanced prices are announced by the manufacturers, lower prices are often made by the wholesale trade who have stocks on hand purchased at former quotations.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 6, 1899), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, # doz. \$3.00...\$3.95@3.95 10%
North's...\$3.95@3.95 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Tree Patent...\$2.55@2.55
Taplin's Perfection...\$5.00

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvil...\$7.40@7.40
Hoy's Budden, Wrought...\$6.95@6.95
Horsehoe brand, Wrought...\$6.95@6.95
Samson...\$7.40@7.40
Trenton, Wrought...\$8.85@8.85

Imported—

Armstrong's Mouse Hole...\$3.00@3.00
Peter Wright's...\$3.00@3.00

Anvil, Vise and Drill—

Millers Falls Co., \$18.00...\$20.00

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Common Double Spur...\$6.00@10.00
Boring Machine Augers...\$6.00@10.00

Car Bits, 12-in. twist—

Car Bits, 12-in. twist...\$6.00@6.00

Jennings' Pattern: Auger Bits—

Auger Bits...\$6.00@6.00

Ford's Auger and Car Bits—

Ford's Auger and Car Bits...\$6.00@6.00

Forster Pat. Auger Bits—

Forster Pat. Auger Bits...\$6.00@6.00

C. E. Jennings & Co.: No. 10 ext. lip: R. Jennings' List—

C. E. Jennings & Co.: No. 10 ext. lip: R. Jennings' List...\$6.00@6.00

No. 30, R. Jennings' List—

No. 30, R. Jennings' List...\$6.00@6.00

Russell Jennings' List—

Russell Jennings' List...\$6.00@6.00

L'Hommedieu Car Bits—

L'Hommedieu Car Bits...\$6.00@6.00

Pugh's Black—

Pugh's Black...\$6.00@6.00

Pugh's Jennings' Pattern—

Pugh's Jennings' Pattern...\$6.00@6.00

Snell's Auger Bits—

Snell's Auger Bits...\$6.00@6.00

Snell's Bell Hangers' Bits—

Snell's Bell Hangers' Bits...\$6.00@6.00

Snell's Car Bits, 12-in. twist—

Snell's Car Bits, 12-in. twist...\$6.00@6.00

Wright's Jennings Bits (R. Jennings' List)—

Wright's Jennings Bits (R. Jennings' List)...\$6.00@6.00

Bit Stock Drills—

Standard List...\$6.00@6.00

Expansive Bits—

Clark's small, \$18; large, \$26...\$6.00@6.00

Lavigne's Clark's Pattern, No. 1—

Lavigne's Clark's Pattern, No. 1...\$6.00@6.00

Steer's No. 1, \$26; No. 2, \$18...\$6.00@6.00

Swan's...\$6.00@6.00

Gimlet Bits—

Common Double Cut, gro. \$1.75@2.55

German Pattern, gro. \$1.00@2.55

Double Cut, makers' lists...\$6.00@6.00

Hollow Augers—

Amer...\$2.55@2.55

Bonney's Adjustable, # doz. \$16.00

New Patent...\$2.55@2.55

Universal...\$2.55@2.55

Ship Augers and Bits—

Ford's...\$4.00@4.00

Snell's...\$4.00@4.00

L'Hommedieu's...\$1.50@1.50

Watrous...\$4.00@4.00

Awl Hfts, See Hfts, Awl.

Awls—

Brad Axl: Handled...gro. \$2.75@3.10

Unhandled, Shouldered...gro. \$3.00@3.50

Unhandled, Patent...gro. \$6.00@7.00

Reg Awls: Unhandled, Patent...gro. \$1.00@1.50

Unhandled, Shouldered...gro. \$6.00@7.00

Scratch Awls: Handled, Common...gro. \$3.50@4.00

Handled, Socket...gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes: First Quality, best brands...\$6.25@6.50

First Quality, other brands...\$5.75@6.00

Jobbers' Special Brands: Good Quality...\$5.50@5.75

Best Quality...\$6.00@6.50

Cheap, Handled Axes...\$5.50@6.50

Beveled, add 15c doz.

Axle Grease—See Grease, Axle.

Axles—

Concord, loose collar...\$4.00 6 c

Concord, solid collar...\$4.00 6 c

No. 1 Common...\$5.00 6 c

No. 1 1/2 Com. New Style...\$5.00 6 c

No. 2, Solid Collar...\$5.00 6 c

Nos. 7, 8, 11 to 14...\$6.00@10.00

Nos. 7, 8, 11 to 14, 100 sets...\$6.00

Nos. 15 to 18...\$6.00

Nos. 19 to 22...\$6.00@10.00

Boxes, Axle—

Common and Concord, not turned...lb. 5c

Common and Concord, turned...lb. 6c

Half Patent...lb. 9c

Balances—

Caldwell new list...\$5.00

Pullman's...\$6.25@6.25

Spring—

Spring Balances...\$6.00@5.00

Chatillon's Light Sizer Balances...\$4.00@10.00

Chatillon Straight Balances...\$4.00

Chatillon Circular Balances...\$4.00

Chatillon's Large D N...\$8.00

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 40 lb., per lb...lb. 4c@5c

Beams, Scale—

Scale Beams, List Jan. 12, '99...\$3.00@3.00

Chatillon's No. 1...\$3.00

Chatillon's No. 2...\$4.00

Beaters—

Standard Co.: No. 5 Steel Handle Dover...\$6.50

No. 10 Cast Handle Dover...\$8.00

No. 10 St. et Handle Dover...\$8.00

No. 15 Extra Heavy Steel Handle...\$15.00

Rival, # gro...\$10.00

Taplin Mfg. Co.: No. 50 Small Family size...\$7.00

No. 100 Regular Family size...\$8.50

No. 102 Regular Family size, tinned...\$9.50

No. 150 Large Family size...\$15.00

No. 152 Large Family size, tinned...\$17.00

Lyon's Standard...\$1.75

Wonder (S. S. & Co.)...\$7.50

Bellows—

Blacksmith—Standard List...\$7.00@7.00

Inch...\$3.30 3 3/4 4 1/2 5 1/2 6 1/2 7 1/2

Each...\$4.25 4.50 5.00 5.50 6.00 6.50 7.00

Molders—

Inch...\$9.10 10 11 12 14 16

Each...\$7.75 7.85 8.50 9.50 13.00 14.50

Hand—

Inch...\$3.75 4.25 4.50 5.00 5.75 6.75

Bells—

Ordinary goods...\$7.50@10.00

High grade...\$7.00@10.00

Jersey...\$7.50@10.00

Texas Star...\$5.00@10.00

Door—

Barton G ng...\$5.50

Gong, Yankee...\$5.50

Home, R. & E. Mfg. Co.'s...\$6.00@10.00

Lever and Pull, Sargent &...\$3.50@10.00

Hand—

Hand Bells, Polished...\$6.00@6.50

White Metal...\$6.00@6.50

Nickel Plated...\$6.00@6.50

Swiss...\$6.00@6.50

Miscellaneous—

Farm Bells...\$2.00@2.50

Steel Alloy Church and School...\$6.00@6.00

Willmot & Hobbs Mfg. Co., Gongs...\$7.00

Belting

Rubber—Common Standard...\$7.00@10.00

Standard...\$6.00@10.00

Extra...\$6.00@10.00

High Grade...\$6.00@10.00

Leather—Extra Heavy, Short Lap...\$5.00@10.00

Regular Short Lap...\$6.00@10.00

Standard...\$6.00@10.00

Light Standard...\$7.00

Cotton—

Rossendale-Redaway B. & H. Co.: Sphinx Brand...\$6.00@10.00

Durable Brand...\$7.00

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters...\$3.00

Ill. Iron & Bolt Co...\$4.00@4.00

Stoddard's Lightning Tire Upsetters...\$4.00@5.00

Bicycle Goods—

Lane's Cycle Hanger...\$3.95@5.00

John S. Lang's Son's 1899 list: Chain...\$5.00

Parts...\$5.00

Spokes...\$6.00

Tubes...\$6.00

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Tackle—Common Wooden...\$7.00@10.00

Clove and Steel...\$6.00@10.00

Eddy's Steel...\$6.00@10.00

Hartz Steel...\$6.00@10.00

Ford's Star Brand Self Lubricating...\$6.00@10.00

Hollow Steel, Ford's Pat. Star Brand...\$6.00@10.00

Lane's Patent Automatic Look and Junior...\$3.00

Stowell's Novelty, Mal. Iron...\$5.00

See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c...\$6.00@6.00

Boils—

Carriage, Machine, &c.—Common, list Jan. 30, '95...\$6.00@15.00

Norway Iron, \$3.00, list Oct. 7, '94...\$7.50@7.50

Phila. Eagle, \$3.00 list May 24, '99...\$7.50@7.50

Bolt Ends, list Jan. 30, '95...\$6.00@6.00

Machine, list Oct. 1, '99...\$6.00@6.00

Note.—Jobbers' prices on Boils are now generally lower than manufacturers'.

Door and Shutter—

Cast Iron Barrel, Round Brass Knob: Inch...\$3.40 4 1/2 5 1/2 6 1/2 8

Per doz...\$3.30 3.50 4.50 5.75 8.00

Cast Iron Spring Foot: Inch...\$6.00 8 10

Per doz...\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned: Inch...\$6.00 8 10

Per doz...\$0.85 1.20 1.50

Cast Iron Shutter, Brass Knobs: Inch...\$6.00 8 10

Per doz...\$0.80 1.20 1.15

Wrought Barrel Brass Knob: Inch...\$3.40 4 1/2 5 1/2 6 1/2 8

Per doz...\$3.40 4.50 5.75 7.00 8.25

Wrought Barrel...\$7.00@10.00

Wrought...\$6.00@10.00

Wrought Flush, B. K...\$6.00@10.00

Wrought Shutter...\$6.00@10.00

Wrought Square Neck...\$6.00@10.00

Wrought Sunk...\$6.00@10.00

Ives' Patent Door...\$3.00@10.00

Stove and Plow—

Plow...\$6.00@10.00

B. L. Caps (Sturtevant Shells)
 \$1.00 \$1.10
 All other primers \$1.10 to \$1.15

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Com., Ball Sngd. \$1.90
B. B. Caps, Round Ball. \$1.15 to \$1.18
Blank Cartridges:
 28 C. F. \$5.50 10¢ to 5¢
 28 C. F. \$7.00 10¢ to 5¢
 22 cal. Rim. \$1.50 10¢ to 5¢
 22 cal. Rim. \$2.75 10¢ to 5¢
 Central Fire 25¢
 Pistol and Rifle 15¢ to 5¢
 Primed Shells and Bullets 15¢ to 5¢
 Rim Fire Sporting 50¢
 Rim Fire, Military 15¢ to 5¢

Casters—

Bed. 60¢ to 10¢ to 70¢
Plate. 60¢ to 10¢ to 70¢
Plate, part Brass. 60¢ to 10¢ to 70¢
Philadelphia. 60¢ to 10¢ to 70¢
Boss. 70¢ to 10¢
Poss Anti-Friction. 70¢ to 10¢
Martin's Patent (Phoenix). 45¢
Payson's Anti-Friction Furniture. 70¢ to 10¢
Payson's Anti-Friction Truck. 70¢ to 10¢
Standard Ball Bearing. 45¢
Tucker's Patent, low list. 80¢

Cattle Leaders—

See Leaders, Cattle.

Chain—

American Coil, Full Coils:
 3-16 1/4 5-16 3/4 7-16 3/4 9-16 1/2
 8-50 6-50 4-75 4-50 4-50 4-50
 1/4 1/2 1 inch.
 4-50 4-50 4-50 cents per lb.
 Less than Cast lots add 10¢ per 100 lbs.
German Coil, list July 21, '97.
 60¢ to 10¢ to 70¢

German Hailer Chain, list July 21, '97. 60¢ to 10¢ to 70¢

Trace, Wagon and Fancy Chains. 60¢ to 10¢ to 70¢

list April, '98. 60¢ to 10¢ to 70¢

Jack Chain, list July 10, '97. 60¢ to 10¢ to 70¢

Iron. 60¢ to 10¢ to 70¢

Brass. 60¢ to 10¢ to 70¢

Gal. Pump Chain. 60¢ to 10¢ to 70¢

Breast, Hitching and Rein Chains. 60¢ to 10¢ to 70¢

Covert Mfg. Co. 60¢ to 10¢ to 70¢

Breast. 35¢ to 25¢

Halter. 35¢ to 25¢

Heel. 35¢ to 25¢

Rein. 35¢ to 25¢

Stallion. 35¢ to 25¢

Onida Community. 60¢ to 10¢ to 70¢

Eureka Coil and Halter. 60¢ to 10¢ to 70¢

Niagara Coil and Halter. 60¢ to 10¢ to 70¢

Niagara Cow Tie. 45¢ to 35¢

Am. Coil and Halter. 60¢ to 10¢ to 70¢

Am. Cow Tie. 35¢ to 25¢

Wire Goods Co. 60¢ to 10¢ to 70¢

Dog Chain. 60¢ to 10¢ to 70¢

Universal Dbl-Jointed Chain. 45¢

Chalk—(From Jobbers.)

Carpenters', Blue. gro. 15¢

Carpenters', Red. gro. 35¢

Carpenters', White. gro. 30¢

See also Crayons.

Chalk Lines—See Lines.

Checks, Door—

Bardley's. 40¢ to 10¢

Columbia. 50¢ to 10¢

Eclipse. 60¢ to 10¢ to 70¢

Chisels—

Socket Framing and Firmer

Standard List. 70¢ to 5¢

Buck Bros. 30¢

Charles Buck. 30¢

Swan's. 30¢ to 10¢ to 25¢

L. & J. White. 30¢ to 10¢ to 25¢

Tanged—

Tanged Firmers. 10¢ to 5¢ to 10¢

Buck Bros. 30¢

Charles Buck. 30¢

L. & J. White, Tanged. 25¢ to 5¢

Cold—

Cold Chisels, good quality, lb. 1¢ to 16¢

Cold Chisels, fair quality. lb. 12¢

Cold Chisels, ordinary. lb. 8¢ to 9¢

Chucks—

Beach Pat., each \$3.00. 20¢

Skinner Patent Chucks. 40¢

Combination Lath Chucks. 30¢

Drill Chucks, Patent and Standard. 30¢

Drill Chucks, New Model. 30¢

Independent Lath Chucks. 40¢

Improved Planer Chucks. 20¢

Universal Lath Chucks. 40¢

Face Plate Jaws. 35¢

Union Mfg. Co. 40¢

Combination. 40¢

Cear Drill. 30¢

Geared Scroll. 30¢

Independent. 40¢

Universal. 40¢

Face Plate Jaws. 35¢

Clamps—

Adjustable, Hammers. 20¢ to 20¢ to 5¢

Adjustable, Stearns. 30¢

Cabinet, Sargent's. 45¢ to 10¢

Carriage Makers', P. S. & W. Co. 40¢ to 10¢

Carriage Makers', Sargent's. 50¢ to 10¢

Beav. Parallel. 30¢ to 10¢

Lineman's, Union Drop Forge & Tool Co. 40¢

Saw Clamps, see Vices, Saw Filers.

Cleaners, Walk—

Star Socket, All Steel. \$ doz. \$4.00 net

Star Shank, All Steel. \$ doz. \$3.75 net

Cleavers, Butchers'—

Foster Bros. 30¢

New Haven, Flat hdl., 30¢; Rd. hdl., 30¢

Nichols Bros., Flat hdl., 30¢; Rd. hdl., 30¢

Fayette R. Plumb. 25¢

P. S. & W. 30¢ to 25¢ to 5¢

L. J. White. 30¢ to 25¢ to 5¢

Clippers—

Chicago Flexible Shaft Company. \$ doz. \$7.50

Mandy Toilet. \$ doz. \$7.50

Mascotte Toilet. \$ doz. \$3.40

Monitor Toilet. \$ doz. \$9.00

Stewart's Patent. \$ doz. \$10.00

Clips, Axle—

Eagle and Superior 1/4 and 5-16

inch. 65¢ to 10¢ to 70¢

Norway, 1/4 and 5-16 inch. 65¢ to 10¢ to 70¢

Cloth and Netting, Wire

—See Wire, etc.

Cocks, Brass—

Hardware list (Globe, Kerosene,

Lever Bibbs, Racking, etc.) 60¢ to 10¢ to 70¢

Compasses, Dividers, &c.

Brass, Pope & Stevens' list. 40¢

Embossed, Gilt, Pope & Stevens' list. 10¢ to 5¢

Leather, Pope & Stevens' list. 40¢

Compasses, Dividers, &c.

Ordinary Goods. 70¢ to 10¢ to 75¢

Bent & Call Hdw. & Tool Co. 65¢

Dividers. 65¢

Callipers, Call's Patent Inside. 55¢

Callipers, Double. 65¢

Callipers, Inside or Outside. 65¢

Callipers, Wing. 60¢

Hamposes. 50¢

J. Stevens & T. Co. 65¢ to 10¢

Conductor Pipe, Galvanized—

Territory. Carload. L. C. L.

Eastern. 60¢ to 25¢ to 1/4¢

Central. 60¢ to 25¢ to 1/4¢

Southern. 60¢ to 25¢ to 1/4¢

S. Western. 60¢ to 25¢ to 1/4¢

Terms, 25 for cash.

See also Eave Trough.

Coolers, Water—

A. S. & Co.: 2-gal., \$14.00; 3-gal.,

\$16.00; 4-gal., \$18.50; 6-gal., \$23.00.

Coopers' Tools—

See Tools, Coopers'.

Cord—

Braided, Drab. lb. 22¢ to 25¢

Braided, White, Common. lb. 16¢ to 18¢

Cable Laid Italian. lb. A. 18¢; B. 18¢

Common India. lb. 8¢ to 9¢

Cotton Sash Cord, Twisted. lb. 12¢ to 18¢

Patent Russia. lb. 12¢ to 18¢

Cable Laid Russia. lb. 12¢ to 18¢

Harmony Cable Laid Italian. lb. 12¢ to 18¢

India Hemp, Braided. lb. 10¢ to 15¢

Patent India. lb. 10¢ to 15¢

Pearl Braided, cotton. lb. 10¢ to 15¢

Massachusetts, White. lb. 22¢ to 25¢

Eddy's Braided Cotton. lb. 12¢ to 18¢

Ossawaun Mills:

Crown, Solid Braided White. lb. 12¢ to 18¢

Braided, Giant, White. lb. 17¢

Peerless:

Cable Laid Italian. lb. 12¢ to 18¢

Cable Laid Russia. lb. 12¢ to 18¢

Cable Laid India. lb. 12¢ to 18¢

Braided India. lb. 12¢ to 18¢

Phoenix, White. lb. 12¢ to 18¢

Samson:

Braided, Drab Cotton. lb. 22¢ to 25¢

Braided, Italian Hemp. lb. 22¢ to 25¢

Braided, Linen. lb. 22¢ to 25¢

Braided, White Cotton, Spot. lb. 22¢ to 25¢

Silver Lake:

A quality, Drab, 40¢. 15¢

B quality, White, 35¢. 15¢

B quality, Drab, 35¢. 15¢

B quality, White, 30¢. 15¢

Italian Hemp, 40¢. 15¢

Linen, 57¢. 15¢

Wire, Picture—

Braided or Twisted. 70¢ to 70¢ to 5¢

Corn Knives and Cutters

—See Knives, Corn.

Corn Planters—

See Planters, Corn.

Crackers, Nut—

Little Giant. \$ gr. \$24.00

Turner & Seymour Mfg. Co. 50¢

Cradles—

Grain. 50¢

Crayons—

White Round Crayons, gross. 5¢ to 6¢

Cases, 100 gro., \$4.50 to \$5.00, at factory.

D. M. Stewart Mfg. Co. \$2.50

Metal Workers' Crayons, gr. \$2.50

Soapstone Pencils, round, flat

or square. gr. \$1.50

Rolling Mill Crayons. gr. \$2.50

Railroad Crayons (compo.

sition) gr. \$2.00

See also Chalk.

Creamery Pails—See Pails,

Creamery.

Crooks, Shepherds'—

Fort Madison, Heavy. \$ doz. \$7.00

Fort Madison, Light. \$ doz. \$6.50

Crow Bars—See Bars, Crow.

Cultivators—

Victor Garden. \$ doz. \$10.00

Cutters—

Glass—

Smith & Hemlinway Co. 30¢

Meat—

American. 1 2 3 4 B 5

Each. \$7 \$10 \$25 \$50 \$80

Connecticut. 0 1 8 10 13

Each. \$1.75 2.25 3.00 4.00 5.50

Enterprise. 25¢ to 25¢ to 7¢

Each. 5 10 12 22 32

Dixon's. \$3 \$3.25 \$4 \$4.50

Each. \$14.00 \$17.00 \$19.00 \$30.00

May 3, 1900

Climlets—
Nail, Metal, Assorted, gro. \$1.50@1.75
Spike, Metal, Assorted, gro. \$3.00@3.50
Nail, Wood Handled, Assorted,
gro. \$4.00@4.25
Spike, Wood Handled, Assorted,
gro. \$5.00@5.25

Class, American Window

List Jan. 1, 1898.
Small lots from store:
Single or Double.
Eastern, First Bracket, .85¢@1.00¢
Eastern, All Other Brackets, .85¢@1.00¢
From Jobbers or Factory, with Freight
Allowance, except in Eastern district:
Carloads, Single Strength.
First Bracket, .85¢@1.00¢
Second and Third Brackets, .85¢
All Above, .90¢@1.00¢
Carloads, Double Strength.
First Five Brackets, .89¢
60 inch Bracket, .90¢
70 to 100 inch Bracket, incl. 100, .90¢@1.00¢
All Above, .90¢@1.00¢

Glue—Liquid, Fish

List A, Bottles or Cans, with Brush.
75¢@80¢

Glue Pots—See Pots, Glue

Common Grade, .50¢@.60¢
Allerton's Axle:
1 lb. Tins, 5¢
1 lb. Tin Pails, 5¢
10 lb. 5¢
25 lb. 12¢
Dixon's Everlasting, 10 lb. 12¢
Dixon's Everlasting, in box, 1 lb. 12¢
1 lb. 12¢

Grindstone Fixtures—

See Fixtures, Grindstone.

Gun Powder—See Powder.

Hack Saws—See Saws.

Hafts, Awi—

Peg Patent, Leather Top, .50¢@.55¢
Peg Patent, Plain Top, .50¢@.55¢
Sewing, Brass Ferrule, .50¢@.55¢
Saddlers', Brass Ferrule, .50¢@.55¢
Peg, Common, .50¢@.55¢
Brad, Common, .50¢@.55¢

Halters and Ties—

Covert Mfg. Co., Web, .45¢@.50¢
Covert Mfg. Co., Jute Rope, .45¢@.50¢
Covert Mfg. Co., Sisal Rope, .45¢@.50¢
Covert's Saddlery Works, 96 list, Web, .45¢@.50¢
Covert's Saddlery Works, Leather, .45¢@.50¢
Covert's Saddlery Works, Jute, .45¢@.50¢
Covert's Saddlery Works, Sisal, .45¢@.50¢
Covert's Saddlery Works, Manila, .45¢@.50¢
Covert's Saddlery Works, Cotton, .45¢@.50¢

Hammers—

Handled Hammers—
Heller's Machinists, .50¢@.55¢
Heller's Farmers, .50¢@.55¢
Magnetic Tack, Nos. 1, 2, 3, .50¢@.55¢
Pax, Stow & Wilcox, .40¢@.45¢
Fayette R. Plumb:
Artisan's Choice, A. R. Nail, .39¢@.45¢
Engineers' and B. S. Hand, .40¢@.45¢
Machinists' Hammers, .50¢@.55¢
A. E. & A. E. Bell Face Nail, .39¢@.45¢
Riveting and Finners, .39¢@.45¢
Sargent's C. S. New List, .45¢@.50¢

Heavy Hammers and Sledges—

1 lb. and under, .10¢
5 to 10 lb., .70¢@1.00¢
Over 10 lb., .80¢
Note—Lower prices sometimes made by jobbers.
Wilkinson's Smith's, .75¢@1.00¢

Handcuffs and Leg Irons

See Police Goods.

Handles—

Agricultural Tool Handles—
Box, Rake, Fork, etc., .60¢@1.00¢
Shovel, etc., Wood D Handle, .60¢@1.00¢
Cross-Cut Saw Handles—
Atlas, .40¢@.45¢
Champion, .45¢@.50¢
Union's, .50¢

Mechanics' Tool Handles—

Auger, assorted, gro. \$2.50@3.00
Auger, large, gro. \$2.50@3.00
Brad Aul, gro. \$1.50@1.75
Chisel Handles:
Apple Tanged Firmer, gro. ass'd.
\$1.50@1.75; large, \$1.75@2.00
Bickory Tanged Firmer, gro. ass'd.
\$1.75@2.00; large, \$2.00@2.50
Apple Socket Firmer, gro. ass'd.
\$1.75@2.00; large, \$2.00@2.50
Bickory Socket Firmer, gro. ass'd.
\$1.80@2.10; large, \$2.10@2.50
Bickory Socket Framing, gro. ass'd.
\$2.50@3.00; large, \$3.00@3.50
File, assorted, gro. \$1.00@1.15
Hammer, Hatchet, Axe, etc., .60¢@1.00¢
Hand Saw, Varnished, doz. 75¢@80¢
Not Varnished, .55¢@60¢
Plane Handles:
Jack, doz. 25¢@30¢; Jack Bolted, .55¢@60¢
Fore, doz. 25¢@30¢; Fore, Bolted, .55¢@60¢

Hangers—

Barn Door, New Pattern, Round
Groove, Regular:
Inch, 3 4 5 6 8
Doz. \$1.10 1.45 1.80 2.10 2.75
Barn Door, New England Pattern,
Check Back, Round Groove, Regular:
Inch, 3 4 5 6
Doz. \$1.50 2.00 2.50 3.25

Chicago Spring Butt Co.

Friction, .25¢
Oscillating, .25¢
Big Twin, .25¢
Chisholm & Moore Mfg. Co.:
Advance, .55¢
Baggage Car Door, .50¢
Elevator, .40¢
Railroad, .55¢
Coleman Hardware Mfg. Co.:
Czar Ball Bearing, pair \$3.50
No. 10 Roller Bearing, doz. pr. 5.50
No. 20 Roller Bearing, doz. pr. 4.50
Nickel, .50¢
J. G. C., .50¢@1.00¢
Lane Bros.:
Parlor, Standard, .40¢@.45¢
Parlor, New Model, .40¢@.45¢
Barn Door, Standard, .40¢@.45¢
Covered, .50¢@1.00¢
Special, .60¢@.75¢
Lawrence Bros.:
Crown, .60¢
New York, .60¢
Sterling, .60¢
McKinney Mfg. Co.:
No. 2, Standard, \$18.00@10¢
No. 1, Special, \$13.00@10¢
Steel Mfg. and Foundry Co.:
Badger, .60¢
Baggage Car Door, .39¢
Climax Anti-Friction, .50¢
Elevator, .40¢
Intestate, .50¢
Machine, .50¢
Matchless, .50¢@1.00¢
Nansen, .50¢@1.00¢
Parlor Door, .50¢
Railroad, .50¢@1.00¢
Street Car Door, .50¢@1.00¢
Steel, Nos. 300, 400, 500, .40¢@.45¢
Wild West, .50¢@.55¢
Zenith for Wood Track, .50¢@1.00¢
Taylor & Boggs Foundry Co.:
Kidder's, .50¢@1.00¢
Van Wagoner & Williams Hdw. Co.:
American Trackless, .39¢@.45¢
Wilcox Mfg. Co.:
Bike Roller Bearing, .60¢@1.00¢
C. J. Roller Bearing, .60¢@1.00¢
Cyclo Ball Bearing, .60¢@1.00¢
L. T. Roller Bearing, .60¢@1.00¢
New Era, .60¢
New Richards, .60¢
O. K. Roller Bearing, .60¢@1.00¢
Prindle Improved, .60¢@1.00¢
Richards' Improved, .60¢@1.00¢
Richards' Single Track, .60¢@1.00¢
Wilcox Dwarf Roller Bearing, .40¢@.50¢
Wilcox Ives, .60¢@1.00¢
Wilcox Tandem Roller Bearing, .60¢@1.00¢
Wilcox Trolley Ball Bearings, .40¢
Wilcox Trolley Roller Bearing, .50¢
Wilcox Trolley Roller Bearing, .40¢@.50¢
Fire, .40¢@.50¢

Harness Menders—See Menders.

Harness Snaps—See Snaps.

Hatches—

Best Brands, .10¢@.10¢
Cheaper Brands, .50¢@1.00¢
Note—Net prices often made.

Hay and Straw Knives—

See Knives.

Hinges—

Blind and Shutter Hinges—
Acme and Dixie Shutter:
No. 1, 1 1/2, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1542, 1544, 1546, 1548, 1550, 1552, 1554, 1556, 1558, 1560, 1562, 1564, 1566, 1568, 1570, 1572, 1574, 1576, 1578, 1580, 1582, 1584, 1586, 1588, 1590, 1592, 1594, 1596, 1598, 1600, 1602, 1604, 1606, 1608, 1610, 1612, 1614, 1616, 1618, 1620, 1622, 1624, 1626, 1628, 1630, 1632, 1634, 1636, 1638, 1640, 1642, 1644, 1646, 1648, 1650, 1652, 1654, 1656, 1658, 1660, 1662, 1664, 1666, 1668, 1670, 1672, 1674, 1676, 1678, 1680, 1682, 1684, 1686, 1688, 1690, 1692, 1694, 1696, 1698, 1700, 1702, 1704, 1706, 1708, 1710, 1712, 1714, 1716, 1718, 1720, 1722, 1724, 1726, 1728, 1730, 1732, 1734, 1736, 1738, 1740, 1742, 1744, 1746, 1748, 1750, 1752, 1754, 1756, 1758, 1760, 1762, 1764, 1766, 1768, 1770, 1772, 1774, 1776, 1778, 1780, 1782, 1784, 1786, 1788, 1790, 1792, 1794, 1796, 1798, 1800, 1802, 1804, 1806, 1808, 1810, 1812, 1814, 1816, 1818, 1820, 1822, 1824, 1826, 1828, 1830, 1832, 1834, 1836, 1838, 1840, 1842, 1844, 1846, 1848, 1850, 1852, 1854, 1856, 1858, 1860, 1862, 1864, 1866, 1868, 1870, 1872, 1874, 1876, 1878, 1880, 1882, 1884, 1886, 1888, 1890, 1892, 1894, 1896, 1898, 1900, 1902, 1904, 1906, 1908, 1910, 1912, 1914, 1916, 1918, 1920, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034, 2036, 2038, 2040, 2042, 2044, 2046, 2048, 2050, 2052, 2054, 2056, 2058, 2060, 2062, 2064, 2066, 2068, 2070, 2072, 2074, 2076, 2078, 2080, 2082, 2084, 2086, 2088, 2090, 2092, 2094, 2096, 2098, 2100, 2102, 2104, 2106, 2108, 2110, 2112, 2114, 2116, 2118, 2120, 2122, 2124, 2126, 2128, 2130, 2132, 2134, 2136, 2138, 2140, 2142, 2144, 2146, 2148, 2150, 2152, 2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168, 2170, 2172, 2174, 2176, 2178, 2180, 2182, 2184, 2186, 2188, 2190, 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206, 2208, 2210, 2212, 2214, 2216, 2218, 2220, 2222, 2224, 2226, 2228, 2230, 2232, 2234, 2236, 2238, 2240, 2242, 2244, 2246, 2248, 2250, 2252, 2254, 2256, 2258, 2260, 2262, 2264, 2266, 2268, 2270, 2272, 2274, 2276, 2278, 2280, 2282, 2284, 2286, 2288, 2290, 2292, 2294, 2296, 2298, 2300, 2302, 2304, 2306, 2308, 2310, 2312, 2314, 2316, 2318, 2320, 2322, 2324, 2326, 2328, 2330, 2332, 2334, 2336, 2338, 2340, 2342, 2344, 2346, 2348, 2350, 2352, 2354, 2356, 2358, 2360, 2362, 2364, 2366, 2368, 2370, 2372, 2374, 2376, 2378, 2380, 2382, 2384, 2386, 2388, 2390, 2392, 2394, 2396, 2398, 2400, 2402, 2404, 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2432, 2434, 2436, 2438, 2440, 2442, 2444, 2446, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472, 2474, 2476, 2478, 2480, 2482, 2484, 2486, 2488, 2490, 2492, 2494, 2496, 2498, 2500, 2502, 2504, 2506, 2508, 2510, 2512, 2514, 2516, 2518, 2520, 2522, 2524, 2526, 2528, 2530, 2532, 2534, 2536, 2538, 2540, 2542, 2544, 2546, 2548, 2550, 2552, 2554, 2556, 2558, 2560, 2562, 2564, 2566, 2568, 2570, 2572, 2574, 2576, 2578, 2580, 2582, 2584, 2586, 2588, 2590, 2592, 2594, 2596, 2598, 2600, 2602, 2604, 2606, 2608, 2610, 2612, 2614, 2616, 2618, 2620, 2622, 2624, 2626, 2628, 2630, 2632, 2634, 2636, 2638, 2640, 2642, 2644, 2646, 2648, 2650, 2652, 2654, 2656, 2658, 2660, 2662, 2664, 2666, 2668, 2670, 2672, 2674, 2676, 2678, 2680, 2682, 2684, 2686, 2688, 2690, 2692, 2694, 2696, 2698, 2700, 2702, 2704, 2706, 2708, 2710, 2712, 2714, 2716, 2718, 2720, 2722, 2724, 2726, 2728, 2730, 2732, 2734, 2736, 2738, 2740, 2742, 2744, 2746, 2748, 2750, 2752, 2754, 2756, 2758, 2760, 2762, 2764, 2766, 2768, 2770, 2772, 2774, 2776, 2778, 2780, 2782, 2784, 2786, 2788, 2790, 2792, 2794, 2796, 2798, 2800, 2802, 2804, 2806, 2808, 2810, 2812, 2814, 2816, 2818, 2820, 2822, 2824, 2826, 2828, 2830, 2832, 2834, 2836, 2838, 2840, 2842, 2844, 2846, 2848, 2850, 2852, 2854, 2856, 2858, 2860, 2862,

Latches, Thumb—
 Roggin's Latches.....doz. 56c@45c
Lawn Mowers—
 See Mowers, Lawn.

Leaders, Cattle—
 Small.....doz. 45c; large, 55c
 Covert atf. Co.....45c@35c

Lemon Squeezers—
 See Squeezers, Lemon.

Lifters, Transom—

Dickson:
 3 x 4 ft. x 1/2".....\$100 \$11.00
 Other sizes, Iron.....70c@10c
 Other sizes, Brass and Bronze.....70c
 Excelator.....60c@60c@10c
 Payson's:
 Solid Grip Nos. 643 and 644, \$1.00
 Bronzed Iron.....70c

Lines—
 Wire Clothes, Nos. 18 19 20
 100 feet.....\$5.00 \$6.00 \$7.00
 75 feet.....\$2.55 \$3.00 \$3.50
 Oseawan Mills:
 Crown Solid Braided Chalk.....\$3.15
 Mason's, No. 0 to No. 5.....\$3.15
 Silver Lake Braided Chalk, No. 0, \$6.00;
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50
 \$7.00

Locks, &c.— Cabinet—
 Cabinet Locks.....\$5.00@35c@75c
Door Locks, Latches, &c.—
 [Net prices are very often made on these goods.]

Reading Hardware Co.....40c
 R. & E. Mfg. Co.....45c@10c
 Sargent & Co.....40c@40c@10c
 Slaymaker-Barry Co.....30c@35c
 Snow's Victor.....50c@10c
Elevator—
 Stowell's.....\$3.00@

Padlocks—
 Wrought Iron, list Dec. 3, '97,
 70c@70c@10c
 Dog Collar, S. B. Co.....40c
 R. & E. Mfg. Co. Wrt. Steel and Brass, 50c
 S. B. & Co.....40c

Sash, &c.—
 Fitch's Bronze and Brass.....60c@
 Fitch's Iron.....70c
 Ives' Patent.....60c@10c@10c
 Payson's Perfect.....70c
 Payson's Signal (new list).....75c
 Reading.....60c@10c@70c

Machines—

Boring—
 Without Augers.
 Upright. Angular.
 Improved No. 3.....\$4.25 No. 1 \$5.00
 Improved No. 4.....3.75 No. 2 3.85
 Improved No. 5.....2.75
 Jennings.....2.50 H.00
 Millers' Falls.....5.75
 Snell's, Rice's Pat. 3.50 2.75
 Swan's, No. 500.....5.10 No. 200 3.45

Holisting—
 Moore's Anti-Friction Differential Pulley Block.....80c
 Moore's Hand Hoist, with Lock Brake, 30c

Washing—
 Wayne American, \$ doz. \$27.00
 Western Star, No. 2, \$ doz. 28.00
 Western Star, No. 3, \$ doz. 30.00
 St. Louis, No. 41, \$ doz. 60.00
Mallets—
 Hickory.....45c@50c@55c
 Lignumvita.....45c@50c@55c
 Timmers', Hickory and Applewood, doz. 50c@55c
 Fiber Head Stearns.....30c@10c

Mats— Door—
 Elastic Steel (W. G. Co.).....10c
Mattocks—
 List Feb. 23, 1899.....65c@65c@10c
Meat Cutters—
 See Cutters, Meat.

Milk Cans—See Cans, Milk.

Mills— Coffee—
 Box and Side, list Jan. 1, '93.....60c@50c@10c@5c
 Net prices are often made on some goods which are lower than above discounts.

Enterprise Mfg. Co.....25c@30c
 National, list Jan. 1, '94.....30c
 Parker's Columbia and Victor.....60c@10c
 Parker's Upright.....30c@10c@40c
 Swift, Lane Bros.....30c

Mining Knives—
 See Knives, Mining.

Molasses Gates—
 See Gates, Molasses.

Money Drawers—
 See Drawers, Money.

Mowers, Lawn—
 Net prices are generally quoted.

10 12 14 16-inch
 Cheap.....3.25 3.50 3.75 4.00
 Good.....4.25 4.50 4.75 5.00
 High Grade 4.25 4.50 4.75 5.00
 Pennsylvania and Continental 60c@10c
 Quaker City.....70c@5c
 Great American.....70c@5c

Philadelphia:
 Styles M. S. C. K. T.....70c@10c
 Style A, all Steel.....60c@10c
 Style E, Low Wheel.....60c@10c
 Style F, High Wheel.....70c@10c
 Drexel and Gold Coin, low list.....60c

Nails—
 Cut and Wire. See Trade Report.
 Wire Nails and Brads, Papered.
 List July 20, 1899.....
 Hungarian, Finishing, Upholsterers', etc. See Tacks.

Horse—
 Nos. 7 8 9 10
 A. C.....25c 23c 22c 21c 51c
 Capewell.....19c 18c 17c 16c 16c@10c
 C. B. K.....25c 23c 22c 21c 51c
 Champlain.....23c 20c 25c 24c 33c
 40c@25c
 Maud S.....25c 23c 22c 21c 21c
 Neponset.....23c 21c 20c 19c 18c
 Putnam.....23c 21c 20c 19c 18c
 Standard.....23c 21c 20c 19c 18c
 Star.....23c 21c 20c 19c 18c
 Vulcan.....23c 21c 20c 19c 18c
 25c@10c

Picture—
 1 1/2 2 2 1/2 3 3 1/2 in.
 Brass Head.....45c 50c 70c 95c 1.00 gro.
 Por. Head.....1.10 1.10 1.10 1.10 gro.

Nippers, See Pliers and Nippers.

Nut Crackers—
 See Crackers, Nut.

Nuts—
 List Feb. 1, '99.
 Cold Punched.....Off
 Mfrs. or U. S. Standard. list.
 Hexagon, plain.....4.00@4.50c
 Square, plain.....4.00@4.50c
 Square, C. T. & E.....3.80@4.00c
 Hexagon, C. T. & E.....4.50@4.50c
 Hot Pressed:
 Mfrs., U. S. or Nar. Gauge Stan'd.
 Square.....4.70@4.90c
 Hexagon.....4.90@5.10c
 NOTE.—Tapped Nuts are now 2-10c higher than above.

Oakum—
 Best or Government.....lb. 64c
 Navy.....lb. 6c
 U. S. Navy.....lb. 54c
 Plumbers' Spun Navy.....5c
 In carload lots 1/4 lb. off f.o.b. New York.

Oil Tanks—See Tanks, Oil.

Oilers—
 Brass and Copper.....10c@10c@50c
 Tin or Steel.....60c@10c@70c@5c
 Zinc.....60c@60c@10c
 Malleable, Hammers' Improved, No. 1, \$3.80; No. 2, \$4.40; No. 3, \$4.40
 Malleable, Hammers' Old Pattern, same list.....50c@10c
 Wilmot & Hobbs Mfg. Co.....70c@70c@10c

Openers—
Can—
 French.....doz. 35c
 Iron Handle.....doz. 25c@25c
 Sprague, Iron Handle.....per doz. 25c@40c
 Sordine Scissors.....doz. 1.75@1.75c
 National, \$1.75@2.00
 Stowell's.....per doz. 40c@40c
Egg—
 Nickel Plate.....per doz., \$2.00
 Silver Plate.....per doz., \$4.00

Packing—
Rubber—
 Standard, fair quality.....70c@10c@75c
 Inferior quality.....75c@10c@80c
 Extra.....60c@10c@80c
 Jenkins' Standard, \$ 30c.....95c@25c@5c

Miscellaneous—
 American Packing.....9c@10c lb.
 Cotton Packing.....15c@16c lb.
 Italian Packing.....10c@11c lb.
 Jute.....5c@5c lb.
 Russia Packing.....15c@15c lb.

Palle—
Creamery—
 S. S. & Co., with gauges. No 1 \$6.50;
 No. 2, \$6.75 per doz.

Galvanized—
 Inch.....10 12 14
 Water, Standard,
 gro.....\$22.00 \$25.00 \$28.00
 Water, Regular.....18.00 21.00 24.00
 Water, Heavy.....22.00 25.50 28.00
 Fire, Rd. Bottom,
 gro.....51.00 53.00 55.00
 Well, gro.....27.00 29.00 31.00

Pans—
Dripping—
 Large Sizes.....lb. 45c
 Small Sizes.....lb. 65c

Fry—
 Standard List.....75c@10c@50c

Roasting and Baking—
 Royal, S. S. & Co., \$ doz. Nos. 5, \$4.50;
 10, \$5.00; 20, \$5.50; 30, \$6.00.
 Simplex, \$ gro. No. 40, \$30.00; 50,
 \$34.50; 60, \$39.00; 140, \$53.00; 150,
 \$37.50; 160, \$43.00.

Paper—
Building Paper—
 Per roll
 Rosin Sized Sheathing: 500 sq. ft.
 Light wt., 20 sq. ft. to lb. \$0.40@0.45
 Medium wt., 12 sq. ft. to lb. \$0.60@0.65
 Heavy wt., extra quality, 30 sq. ft. to lb. \$0.95@1.05
 Medium Grades Water Proof
 Sheathing.....\$0.80@1.25
 Deafening Felt, 9, 6 and 1 1/2 sq. ft. to lb., ton.....\$5.00@60.00
 York Haven Waterproof Sheathing.....\$1.35@1.75

Tarred Paper.
 1 ply (roll 300 sq. ft.), ton.....\$35.00@40.00
 2 ply, roll 100 sq. ft.....90c
 3 ply, roll 100 sq. ft.....1.20

Sand and Emery—
 List Dec. 23, 1899.....60c@10c@10c@10c
 See Trade Report.

Parers—
Apple—
 Advance.....\$ doz. \$4.50
 Baldwin.....\$ doz. \$5.00
 Bonanza.....each \$5.00
 Dandy.....each \$7.50
 Eureka, 1898.....each \$16.00
 Family Bay State.....\$ doz. \$12.00
 Hudson's Little Star.....\$ doz. \$4.00
 Hudson's Rocking Table.....\$ doz. \$5.50
 Improved Bay State.....\$ doz. \$37.00@30.00
 New Lightning.....\$ doz. \$5.50
 Reading 72.....\$ doz. \$4.00
 Reading 78.....\$ doz. \$7.00
 Turn Table 98.....\$ doz. \$5.50
 White Mountain.....\$ doz. \$4.00

Potato—
 Saratoga.....\$ doz. \$5.50
 White Mountain.....\$ doz. \$4.50

Paris Green—
 Arsenic, kegs or casks.....lb. 15 c
 Kegs, 100 to 175 lb.....lb. 15c@
 Kits, 1 lb. 28, 56 lb.....lb. 14c@
 Paper boxes, 2 to 5 lb.....lb. 14c@
 Paper boxes, 1 lb.....lb. 15 c
 Paper boxes, 1/2 lb.....lb. 16 c
 Paper boxes, 1/4 lb.....lb. 17 c

Picks and Mattocks—
 List Feb. 23, 1899.....85c@65c@10c

Pinking Irons—
 See Irons, Pinking.

Pins—
Escutcheon—
 Brass.....60c@60c@5c
 Iron, list Nov. 11, '93.....60c@60c@5c

Pipe, Cast Iron Soil—
 Factory Shipments.
 Standard, 2-6 in.....50c@50c@10c
 Extra Heavy, 2-6 in.....50c@10c@60c
 Fittings.....60c@60c@10c

Pipe, Wrought Iron—
 Black Merchant Pipe in Carload Lots from Jobbers:
 1/2 to 1 1/2-inch.....25c@10c
 1 1/2 to 2-inch.....25c@10c@10c
 2 to 4-inch.....25c@10c@10c@10c
 4 to 12-inch.....25c@10c@10c@10c
 Galvanized Pipe in Carload Lots from Jobbers:
 1/2 to 1 1/2-inch.....17c@10c@10c
 1 1/2 to 2-inch.....20c@10c@10c
 2 to 4-inch.....20c@10c@10c
 4 to 12-inch.....20c@10c@10c
 NOTE.—The old list is still used by some jobbers, and prices are not entirely uniform.

Planes and Plane Irons—
Wood Planes—
 Molding.....10c@10c@10c@5c
 Bench, First quality.....45c@10c@10c@5c
 Bench, Second quality.....50c@10c@10c@5c
 Bailey's (Stanley R. & L. Co.)
 50c@10c@50c@10c@10c
 Gage Self Setting.....35c
 Bailey's (Stanley R. & L. Co.)
 50c@10c@50c@10c@10c
 Chaplin's Iron Planes.....50c@10c
 Miscellaneous Planes (Stanley R. & L. Co.).....25c@10c@50c@10c@60c
 Sargent's.....50c@10c@60c

Plane Irons—
 Wood Bench Plane Irons.....35c@5c@5c
 Butcher's.....\$5.00@5.25 to 2
 Stanley R. & L. Co.....50c@10c@50c@10c@10c
 L. & J. White.....20c@25c@35c

Planters, Corn, Hand.
 Kohler's Eclipse.....\$ doz. \$6.00

Plates—
 Felco.....lb. 5c@5c@
 Self-Sealing Pie Plates (S. S. & Co.), \$ doz. \$3.00.....50c

Pliers and Nippers—
 Button Pliers.....65c@10c@70c@10c
 Gas Burner, per doz., 5 in., \$1.15@
 \$1.20; 6 in., \$1.55@1.15.
 Gas Pipe.....2 10 12-in.
 Aseme Nippers.....\$1.75 \$2.00 \$2.75 \$3.75
 Bernard's.....40c@40c@5c
 Parallel Pliers, 20.....33c@
 Paragon Pliers.....50c
 Lodi Pliers.....50c
 Elm City Fence Pliers.....53c@

Helier's Parriers' Nippers, Piners, and Tools 50c@25c
 Morrill's Parallel, \$ doz. \$12.00.....30c
 P. S. & W. Cast Steel.....30c@10c@40c
 P. S. & W. Timmers' Cutting Nippers.....40c@40c@
 Udea Drop Forge & Tool Co.:
 Pliers and Nippers, all kinds.....40c

Plumbs and Levels—
Plumbs and Levels—
 70c@10c@10c@75c@10c@10c
 Disston's.....70c@10c@10c@75c@10c@10c
 Pocket Levels.....70c@10c@10c@75c@10c@10c
 Stanley R. & L. Co.....70c@10c@10c@75c@10c@10c
 Stanley's Duplex.....25c@10c@25c@10c@10c
 Woods' Extension.....35c@

Poachers, Egg—
 Buffalo Steam Egg Poachers, \$ doz. No. 1, \$7.20; No. 2, \$11.00; No. 3, \$11.00; No. 4, \$14.50.....30c

Points, Glaziers—
 Bulk and 1 lb. glaziers.....lb. 11c@12 c
 1/4-lb. papers.....lb. 12 c@11c
 1/4-lb. papers.....lb. 12c@11c

Pokes, Animal—
 Ft. Madison Hawkeye.....\$ doz. \$3.25
 Ft. Madison, Western.....\$ doz. \$3.75

Police Goods—
 Manufacturers' Lists.....\$5c@5c@25c

Polish—Metal—
 Prestoline Liquid, No. 1 (1/4 pt.), \$ doz. \$3.00; No. 2 (1 qt.), \$0.75.....40c
 Prestoline Paste.....\$35c@40c
 U. S. Metal Polish Paste, 8 oz. boxes, \$ doz. 50c; \$ gr. \$4.50; 1/2 lb. boxes, \$ doz. \$1.35; 1 lb. boxes, \$ doz. \$2.25
 U. S. Liquid, 8 oz. cans, \$ doz. \$1.25; \$ gr. \$12.00.
 Barkkeepers' Friend Metal Polish, \$ doz. \$1.75; \$ gr. \$18.00.
 Wynn's White Silk, 1/4 pt. cans, \$ doz. \$1.50

Stove—
 Black Eagle Benzine Paste, 5 lb. cans, \$ doz. \$1.04
 Black Eagle, Liquid, 1/4 pt. cans.....\$ doz. 75c
 Black Jack Paste, 1/2 lb. cans, \$ gr. \$0.40
 Ladd's Black Beauty, \$ gr. \$10.00.....50c
 Joseph Dixon's, \$ gr. \$5.75.....10c
 Dixon's Plumbago.....\$ gr. \$2.50
 Firestone.....\$ gr. \$2.50
 Gem, \$ gr. \$4.50.....\$ gr. \$2.50
 Japanese.....\$ gr. \$3.50
 Jet Black.....\$ gr. \$3.50
 Peerless Iron Enamel, 1/4 pt. cans.....\$ doz. \$1.50
 Wynn's Black Silk, 5 lb. pail.....\$ doz. \$1.50
 Wynn's Black Silk, 1/2 lb. box, \$ doz. \$1.50
 Wynn's Black Silk, 6 oz. box, \$ doz. \$1.75
 Wynn's Black Silk, 8 oz. liq., \$ doz. \$1.00

Poppers, Corn—
 Round or Square:
 1 qt.....gro. \$7.00@8.00
 1 1/2 qt.....gro. 9.50@10.50
 2 qt.....gro. 10.50@11.50
 Quincey Corn Popper, 1 qt., \$ gr. \$16.50; 2 qt., \$19.00.

Post Hole and Tree Augers and Diggers—
 See also Diggers, Post Hole, &c.

Potato Parers—
 See Parers, Potato.

Pots—
Glue—
 Enameled.....10c@5c@10c@10c
 Tinned.....10c@10c@

Powder—
In Canisters:
 Duck, 1 lb. each.....45c
 Fine Sporting, 1 lb. each.....75c
 Rifle, 1/2 lb. each.....15c
 Rifle, 1 lb. each.....85c
In Kegs:
 Duck, 6 1/4-lb. kegs.....\$2.25
 Duck, 12 1/2-lb. kegs.....\$4.25
 Duck, 25-lb. kegs.....\$6.00
 Rifle, 6 1/4-lb. kegs.....\$1.25
 Rifle, 12 1/2-lb. kegs.....\$2.25
 Rifle, 25-lb. kegs.....\$4.00
 King's Smokeless:
 Keg (25 lb. bulk).....\$20.00
 Half Keg (12 1/2 lb. bulk).....\$10.25
 Quarter Keg (6 1/4 lb. bulk).....\$5.25
 Canister (1 lb. bulk).....\$0.90
 Case, 1 lb. Canisters (50 lb. bulk).....\$45.00
 Half Case, 1 lb. Canisters (25 lb. bulk).....\$22.75
 King's Semi-Smokeless:
 Keg (25 lb. bulk).....\$10.00
 Half Keg (12 1/2 lb. bulk).....\$5.25
 Quarter Keg (6 1/4 lb. bulk).....\$2.75
 One Pound Can, bulk.....\$0.50

Presses—
Fruit and Jelly—
 Enterprise Mfg. Co.....\$0c@35c

Pruning Hooks and Shears—See Shears.

Pullers, Nail—
 Crown, \$ doz. \$18.00.....50c
 Crown Prince, \$ doz. \$15.00.....80c
 Cyclops.....40c@40c@
 Diamond B, No. 2, doz. \$22.; No. 3, \$11.....40c
 Eureka, 5 lb. doz. \$16.00; 3 lb. \$15.50
 Giant, No. 1, \$ doz. \$18.; No. 2, \$16.50
 No. 3, \$15.
 National, \$ doz. \$24.00.....40c
 Miller's Falls, No. 3, per doz. \$12.00
 Pelican, \$ doz. \$9.00.....40c
 Scranton No. 1 and 2, \$ doz. \$2.00
 Scranton, No. 3, \$ doz. \$2.00

Shovels and Tongs—

Brass Head.....60¢@60¢10¢
 Iron Head.....60¢@60¢10¢

Sieves and Sifters—

Hunter's Imitation, gro. \$11.00@19.00
 Buffalo Metallic Blue, S. S. & Co., gr. 1
 14&16 18&18 19&20
 \$12.90 \$13.80 \$15.00
 Eclipse.....gr. \$10.00
 Electric Light.....gr. \$12.00
 Hunter's Genuine.....gr. \$12.50
 Shaker (Barler's Pat.) Flour Sifters
 gr. doz., \$2.00.....55¢

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
 Mesh 18, Nested, doz. \$0.75@0.80
 Mesh 20, Nested, doz. 85¢@.90
 Mesh 24, Nested, doz. 1.00@1.05

Sinks—**Cast Iron—**

Low list.....50¢@10¢60¢

NOTE—The low list is now generally used, but some jobbers use high list.

Wrought Steel—

Columbus Galv'd and Enamelled.....60¢@5¢
 Columbus, Painted.....45¢
 L. & G.....50¢

Sinks, Wagon—

Cast Iron.....70¢@70¢10¢
 Malleable Iron.....10¢@10¢50¢
 Steel.....55¢@55¢55¢
 I. L. & Co. Steel.....55¢

Slates—

"D" Slates.....60¢@10¢50¢10¢10¢
 Unexcelled Noiseless Slates.....
 60¢@10¢50¢10¢10¢
 Wire Bound.....10¢@10¢50¢
 Double Slates, add \$1 case, net.

Slaw Cutters—See Cutters.**Snaps, Harness—**

German.....40¢@40¢10¢
 Covert Mfg. Co.:
 Derby.....55¢@55¢
 High Grade.....45¢@55¢
 Jockey.....40¢@55¢
 Trojan.....45¢@55¢

Covert's Saddlery Works:

Banner.....60¢@10¢
 Crown.....60¢@10¢
 Triumph.....60¢@10¢

W. & E. T. Fitch Co.:

Bristol.....40¢@10¢
 Empire.....50¢@55¢
 German.....40¢
 National.....60¢@55¢
 Perfect.....45¢
 Clipper.....60¢@55¢
 Champion.....40¢
 Security.....40¢
 Victor.....60¢@55¢

Onel is community:
 Solid Steel.....65¢@55¢10¢
 Solid Steel.....65¢@10¢55¢10¢
 Sargent's Patent Guarded.....
 60¢@60¢55¢10¢

Snaths—

Scythe.....45¢@55¢

Snips, Tinnere—See Shears.**Soldering Irons—**

See Irons, Soldering.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—**Silver Plated—**

Flat Ware.....60¢@10¢60¢10¢
 Wm. Rogers Mfg. Co.....50¢@10¢

Miscellaneous—

German Silver.....60¢@10¢
 Wm. Rogers Mfg. Co.:
 185 German Silver.....60¢
 Rogers' Silver Metal.....50¢@10¢

Springs—**Door—**

Gem (Coil).....20¢
 Star (Coil).....30¢
 Torrey's Rod, 30 in. gr. \$1.10@1.35
 Warner's No. 1, gr. \$1.50; No. 2,
 \$3.40.....55¢@55¢10¢
 Victor (Coil).....60¢@10¢60¢10¢55¢

Carriage, Wagon, & Co.**Factory Shipments.**

1 1/4 in. and wider.....Blk. Hf. Brt. Brt.
 Tested and Temp. 5/4 5/4 5/4 1/2 lb
 Oil Tested and
 Tempered.....6 1/4 6 1/4 5/4 1/2 lb
 Cliff's Bolster Springs.....35¢
 Cliff's Seat Springs.....pair 55¢

Sprinklers, Lawn—

Enterprise.....55¢@30¢
 Philadelphia No. 1, gr. \$1.15; No. 2,
 \$1.50; No. 3, \$2.40.....30¢

Squares—

Nickel plated.....List Jan. 5, 1900
 Steel Wire Brads, R. & E. Mfg.
 Co.'s list.....50¢@10¢60¢
 See also Nails, Wire.
 Iron Hdl. Try Squares and T-Bevels,
 10¢@10¢10¢10¢
 Diston's Try Sq. and T-Bevels.....60¢@10¢
 Waterbottom's Try and Miter.....50¢@10¢

Squeezers—**Lemon—**

Wood, Common, gro., No. 0, \$5.55
 @ \$5.50; No. 1, \$5.55@ \$5.50.
 Wood, Porcelain Lined:
 Cheap.....dos. \$2.00@ \$2.75
 Good Grade.....dos. \$3.00@ \$3.50

Tinned Iron.....doz. \$0.75@1.25
 Iron, Porcelain Lined doz. \$3.50@3.55
 Jennings' Star.....gr. \$1.85@1.90
 King.....gr. doz. \$3.00

Staples—

Barbed Blind.....lb. 9¢@10¢
 Electricians' Association list.....75¢@10¢
 Fence Staples, same price as Barbed
 Wire. See Trade Report.
 Poultry Netting.....80¢@10¢
 Grand Crossing Tack Co.'s list.....75¢@10¢

Steels, Butchers—

Dick's.....40¢
 Foster Bros'.....30¢
 C. & A. Hoffmann's.....40¢
 Nichols Bros.....50¢

Steelyards—

Blacksmiths'.....40¢@10¢10¢

Gardner.....50¢
 Green River.....25¢
 Lightning Screw Plate.....35¢
 Little Giant.....25¢
 Reese's New Screw Plate.....35¢@30¢
 Curtis Reversible Ratchet Die Stock.....35¢

Stone—**Scythe Stones—**

Pike Mfg. Co., list '95-'96.....35¢@4¢
 Cleveland Stone Co., list Nov. '98.....35¢@4¢

Oil Stones, & Co.

Pike Mfg. Co.:
 Hindostan No. 1, gr. 35¢
 Sand Stone.....5¢
 Turkey Oil Stone, Extra.....83¢@10¢
 5 to 5 in.....80¢
 Turkey Slips.....\$1.50
 Lily White Washita.....50¢
 Rosy Red Washita.....60¢
 Washita Stone, Extra.....50¢
 Washita Stone, No. 1.....40¢
 Lily White Slips.....30¢
 Rosy Red Slips.....30¢
 Washita Slips, Extra.....30¢
 Washita Slips, No. 1.....70¢
 Arkansas Stone, No. 1, 5 to 5 in. \$3.50
 Arkansas Stone, No. 1, 5 to 5 in. \$3.50
 India Oil Stoves.....55¢@30¢
 Tanite Mills:
 Emery Oil, gr. doz. \$5.00.....50¢@80¢

Stoners—**Cherry—**

Enterprise.....25¢@30¢

Stops, Bench—

Millers Falls.....15¢@10¢
 Morrill's.....gr. doz. No. 1, \$10.00; No. 2,
 \$11.00, 40¢@20¢

Stops, Window—

Ives' Patent.....35¢@55¢
 Taplin's.....45¢
 Wilcox, Steel, per doz., \$0.00.....60¢

Stove Boards—

See Boards, Stove.

Stove Polish—See Polish, Stove.**Straps, Box—**

Cary's Universal, case lots.....20¢@10¢

Stretchers, Carpet—

Cast Iron, Steel Points.....dos. 55¢@65¢
 Cast Steel, Polished.....dos. 35¢@55¢
 Sockel.....dos. \$1.75

Stuffers, Sausage—

Miles' Challenge, gr. doz. \$20.....50¢@50¢55¢
 Enterprise Mfg. Co.....25¢@35¢75¢
 National Specialty Mfg. Co., list Jan.
 1, '97.....30¢

Tacks, Brads, & Co.—

See Trade Report,
 List Jan. 15, '99.
 Carpet Tacks:
 American Blued.....80¢@10¢
 American Tinned.....80¢@10¢
 American Cut Tacks.....90¢
 Swedes Iron Tacks.....80¢@10¢
 Swedes Upholsterers' Tacks.....80¢@10¢

Gimp Tacks.....80¢@10¢
 Lace Tacks.....80¢@10¢
 Trimmers' Tacks.....80¢@10¢
 Looking Glass Tacks.....70¢
 Bill Posters' and Railroad Tacks.....80¢@10¢
 Hungarian Nails.....80¢@15¢
 Common and Patent Brads, 70¢@5¢
 Trunk and Clout Nails, 75¢@10¢
 NOTE—The above prices are for
 Straight Weights. An extra 5¢ is given
 Star Weights and an extra 10¢ on
 Standard Weights.

Miscellaneous—

Double Point Tacks.....5¢@4¢ or 5¢ tens
 Steel Wire Brads, R. & E. Mfg.
 Co.'s list.....50¢@10¢60¢
 See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. \$3.20
 Emerald, S. S. & Co.....60-gal. \$4.00
 Queen City S. S. & Co., 30-gal.....\$3.50
 Queen City S. S. & Co., 60-gal.....\$4.25

Tapes, Measuring—

American Ases' Skin.....10¢@10¢50¢
 Patent Leather.....85¢@30¢55¢
 Steel.....10¢@10¢55¢
 Chesterman's.....95¢@55¢55¢

Kddy's Steel.....40¢@40¢55¢
 Eddy's Metallic.....35¢@35¢45¢
 Keuffel & Esser Co., Steel and Metallic.
 Lower list, 1899.....35¢
 Larkin's Steel.....35¢@35¢45¢
 Larkin's Metallic.....80¢@55¢

Thermometers—

Tin Case.....30¢@30¢10¢

Ties, Bale—Steel.

Standard Wire.....50¢@10¢55¢

Ties, Wall—

Cleveland, Steel.....\$ 1000, \$10.00

Tinnere's Shears, & Co.—

See Shears, Tinnere's, & Co.

Tinware—

Stamped, Japanned and Pieced, sold
 very generally at net prices.

Tire Benders, Upsetters,

& Co.—See Benders and Upset-

ters, Tirs.

Tobacco Cutters—

See Cutters, Tobacco.

Tools—**Coopers—**

L. & J. White.....30¢@30¢55¢

Saw—

Atkins' new list.....40¢
 Simonds' Improved.....35¢@45¢
 Simonds' Crescent.....35¢

Ship—

L. & J. White.....25¢

Transom Lifters—

See Lifters, Transom.

Traps—Game—

Oneida Pattern.....70¢@10¢75¢10¢
 Newhouse.....45¢@50¢
 Hawley & Norton.....55¢@70¢
 Victor (Oneida Pattern).....75¢@75¢10¢
 Star (Blake Pattern).....65¢@10¢70¢55¢

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 8¢@10¢

Mouse, Round or Square Wire.....
 doz. \$0.85@1.00

Marty French Rat and Mouse Traps
 (Genuine).....
 No. 1, Rat, gr. doz. \$12.00; case of 24
 \$10.50
 No. 2, Rat, gr. doz. \$5.50; case of 50
 \$5.00
 No. 3, Rat, gr. doz. \$1.50; case of 75
 \$4.00
 No. 4, Mouse, gr. doz. \$3.50; case of 75
 \$2.75
 No. 5, Mouse, gr. doz. \$2.75; case of 150
 \$2.25
 Schuyler's Rat Killer, No. 1, gr. \$30.00;
 No. 2, gr. \$30.00; Mouse, No. 3,
 \$15.00;
 Out of Sight, Mouse, No. 1, gr. 60¢;
 Rat, No. 2, \$1.25; Mole, \$2.00;
 Gopher, \$1.50; Stop Thief, No. 1,
 \$1.25; No. 2, \$1.50.

Flv—

Balloon, Globe or Acme.....
 doz. \$1.15@1.25; gro. \$12.00@14.00
 Harper, Champion or Paragon.....
 doz. \$1.25@1.40; gro. \$13.50@15.00

Trimmers, Spoke—

Bonner's Nos. 1 and 2.....40¢
 Stearns.....25¢

Trowels—

Diston Brick and Pointing.....30¢
 Diston Plastering.....25¢
 Diston "Standard Brand" and Gar-
 den Trowels.....25¢
 Never-Break steel Garden Trowels.....
 gro. \$7.00
 Peace's Plastering.....30¢
 Rose Brick and Plastering.....25¢
 Woodrough & McParlin, Plastering.....35¢@10¢

Trucks, Warehouse, & Co.—

B. & L. Block Co.'s list.....40¢
 Daisy Stove Trucks, Improved pattern
 gr. doz. \$21.00

Tubs, Wash—

No. 1 2 3

Galvanized, per doz. \$5.00 @ 50 6.00

Galvanized S. S. & Co., with Wringer

Attachment, gr. doz. No. 10, \$7.25

No. 20, \$7.75; No. 30.....\$3.25

Twine—**Binder—**

Carload lots f.o.b. New York, Phila-

delphia or Boston.

White Sisal, 500 ft. to lb. per lb. 11¢@

Standard, 500 ft. to lb. per lb. 11¢@

Manila, 500 ft. to lb. per lb. 16¢@

Pure Manila, 500 ft. to lb. per lb. 16¢@

Less than carloads add 1/4¢ per lb.

Miscellaneous—**Flax Twine—**

No. 2, 1/4 and 1/2 lb. Balls.....20¢ B.

No. 1, 1/4 and 1/2 lb. Balls.....15¢ B.

No. 1, 1/4 and 1/2 lb. Balls.....15¢ B.

No. 2, 1/4 and 1/2 lb. Balls.....15¢ B.

No. 3, 1/4 and 1/2 lb. Balls.....15¢ B.

Chalk Line, Cotton, 1/2 lb. Balls.....18¢@40¢

Cotton Mops, 6, 9, 12 and 15 lb. to

doz.....7¢@8¢

Cotton Wrapping, 5 Balls to lb.....18¢@

American 2-Ply Hemp, 1/4 and 1/2 lb.

Balls.....12¢@15¢

American 3-Ply Hemp, 1-lb. Balls.....12¢@15¢

12¢@15¢

India 2-Ply Hemp, 1/4 and 1/2 lb.
 Balls (Spring Twine).....10¢
 India 3-Ply Hemp, 1-lb. Balls.....10¢
 India 2-Ply Hemp, 1/4-lb. Balls.....10¢
 s, s, 1 and 2-Ply Jute, 1/2-lb. Balls.....10¢

Mason Line, Linen, 1/2-lb. Balls.....10¢
 No. 104 Mattress, 1/4 and 1/2-lb. Balls.....10¢
 Wool.....10¢

Vises—

Solid Box.....40¢@10¢
 Bonney's Saw Vises.....40¢@10¢

Parallel—

Atchaf Machine Co.:
 Simpson's Adjustable.....40¢
 Standard.....40¢
 Amateur.....25¢
 Bonney's.....40¢@10¢
 Fisher & Norris Double Screw.....15¢@10¢
 Hollands'.....40¢@10¢
 Lewis Tool Co.....20¢@5¢
 Massey's Perfect.....15¢@10¢
 Massey's Clincher.....35¢@40¢
 Merrill's.....20¢
 Miller's Falls.....Low list 10¢
 Parker's:
 Victor.....20¢@25¢
 Regulars.....20¢@25¢
 Vulcan.....40¢@45¢
 Combination Pipe.....55¢@60¢
 Prentiss.....25¢@25¢
 Sargent's.....40¢
 Simpson's Adjustable.....40¢
 Smedley's X. L.....20¢@25¢
 Stephens'.....20¢@25¢
 Toler Woodworking.....20¢@25¢
 Van, W. & W. Hdw. Co.....20¢

Saw Filers—

Bonney's No. 1, \$18; No. 3, \$16, \$10, \$10

Diston's D 3 Clamp and Guide, gr. doz

\$30.....40¢@10¢

Reading.....40¢@10¢

Wentworth's Rubber Jaw, Nos. 1, 2

and 3.....30¢@75¢

Miscellaneous—

Signal & Keeler Combination Pipe

Vise.....50¢

Parker's Combination Pipe:

87 Series.....20¢

187 Series.....30¢@35¢

No. 870.....40¢

Wads—Price Per M.

B. E., 11 up.....60¢

B. E., 9 and 10.....70¢

B. E., 8.....80¢

B. E., 7.....80¢

P. E., 11 up.....\$1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger.....\$1.70@1.75

Washers—**Leather, Axle—**

Solid.....80¢10¢10¢10¢
 Patent.....85¢10¢10¢10¢
 Coil: 1/4 1 1/2 1 3/4 1 1/2
 1/2 1 1/2 1 3/4 1 1/2

Iron or Steel—

Size bolt....5-16 3/4 1/2 3/4 1/2
 Washers.....\$6.30 5.50 4.00 3.80 3.50
 In lots less than one keg add 1/4¢ per lb., 5-lb. boxes add 1/4¢ to list.

Cast Washers—

Over 1/2 inch, barrel lots.....per lb., 2¢

Washer Cutters—

See Cutters, Washer.

Washing Machines—

See Machines, Washing.

Water Coolers—

See Coolers, Water.

Weaners—

Tyler's New Hammer—No. 1 # doz. \$8.45;
 No. 2 # doz. \$8.70; No. 3 # doz. \$9.40
 Tyler's Safety—Nos. 1 and 2, # doz. \$1.70;
 No. 3 # doz. \$2.00; No. 4 # doz. \$2.30.

Wedges—

Oil Finish.....lb. 4¢1/4¢
 Axe Finish.....lb. 4¢1/4¢

Weights, Sash—

Eastern prices.....\$55.00@57.00
 Western prices.....\$50.00@53.50

NOTE.—There is a wide difference in prices East and West, and some Foundries are naming lower prices than the above.

Well Buckets, Galvanized

See Pails, Galvanized.

Wheels Well—

8-in. \$1.75@2.00; 10-in. \$2.25@2.50;
 12-in. \$2.75@3.25; 14-in. \$4.00@4.50

Wire and Wire Goods—

Brl. and Ann., 6 to 9.....65¢65¢55¢
 Brl. and Ann., 10 to 12.....65¢74¢67¢55¢

Brl. and Ann., 19 to 25.....75¢74¢74¢74¢
 Brl. and Ann., 27 to 35.....75¢74¢74¢74¢

Cop'd and Galv., 6 to 9.....60¢60¢55¢
 Cop'd and Galv., 10 to 12.....60¢60¢55¢

Tinned, 6 to 12.....67¢67¢67¢67¢
 Tinned, 15 to 18.....65¢65¢55¢

Annealed Wire on Spools.....60¢10¢60¢10¢55¢

Brass, list Feb. 26, '96.....\$0.25

Copper, list Feb. 26, '96.....15¢

Cast Steel Wire.....50¢

Stubs' Steel Wire.....\$6.00 to 2, 40¢

Wire Clothes Line, see Lines.

Wire Picture Cord, see Cord.

Bright Wire Goods—

Iron and Brass, list July 1, 1899.....80¢10¢80¢10¢10¢

Wire Cloth and Netting—

Galvanized Wire Netting.....75¢10¢75¢10¢75¢

Painted Screen Cloth per 100 ft.....\$1.50@

Hardware Grade, 8 to 18 mesh.....sq. ft. 8¢1/2¢3¢

Hardware Grade, 20 x 20 mesh.....sq. ft. 5¢1/2¢3¢

Galv. Hardware Grade, 8 to 18 mesh.....sq. ft. 5¢1/2¢3¢

Galv. Hardware Grade, 20 x 20 mesh.....sq. ft. 5¢1/2¢3¢

Wire Barb—See Trade Repor.

Wire, Rope—See Rope, Wire.

Wrenches—

Agricultural.....70¢10¢70¢10¢55¢

Baxter's S.....60¢10¢

Coe's Genuine.....\$5.10¢5.5¢5.3¢

Coe's "Mechanics".....\$5.10¢5.5¢5.3¢

Acme.....\$2.00@3.30

Alken's Pocket (Bright).....60¢10¢10¢

Alligator.....60¢10¢10¢

Bemis & Call's:

Adjustable S.....35¢55¢

Adjustable S Pipe.....40¢

Brigg's Pattern.....80¢10¢

Combination Black.....40¢55¢

Combination Bright.....40¢

Cylinder or Gas Pipe.....45¢

Extra Heavy.....50¢

Merrick's Pattern.....55¢

No. 3 Pipe, Bright.....55¢

Bindley Automatic.....80¢

Boardman's.....35¢1/2

Bull Dog, W. & B.....60¢10¢10¢

Donohue's Engineer.....40¢10¢

Eagle.....50¢10¢

Hercules.....70¢

Solid Handles, F. S. & W.....40¢10¢

Stevenson.....60¢10¢10¢

Stillson's.....55¢

Wrought Goods—

Staples, Hooks, etc., list March 17 '98.....35¢35¢55¢

Yokes, Neck—

Covert Saddle Works Trimmer 1.60¢55¢

Covert Saddle Works, Neck Yoke

Centers.....70¢

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers & Freighters' list net

Zinc—

Sheet.....lb 7¢@7 1/4¢

PAINTS, OILS AND COLORS.—Wholesale Prices.**White Lead, Zinc, &c.**

Lead, Foreign white, in Oil.....7 1/4¢ 9 1/4¢

Lead, American White, in Oil:

Lots of 500 lb or over.....6 1/4¢

Lots less than 500 lb.....7

Lead, White, in oil, 25 lb tin.....3 1/4¢

Lead, White, in oil, 13 1/2 lb tin.....1

Lead, White, add to keg price.....1

Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.....1 1/4¢

Lead, White, Dry in bbls.....5 1/4¢ 6

Lead, American, Terms: On lots of 500

lbs. and over, 60 days, or 95 for cash if

paid in 15 days from date of invoice.

Zinc, American, dry.....5 1/4¢ 5 1/4¢

Zinc, Paris, Red Seal.....5 1/4¢ 5 1/4¢

Zinc, Paris, Green Seal.....5 1/4¢ 5 1/4¢

Zinc, Antwerp, Red Seal.....5 1/4¢ 5 1/4¢

Zinc, Antwerp, Green Seal.....5 1/4¢ 5 1/4¢

Zinc, V. M. in Poppy Oil, G. Seal

lots of 1 ton and over.....11 1/4¢

lots less than 1 ton.....12 1/4¢

Zinc, V. M. in Poppy Oil, Red Seal

lots of 1 ton and over.....10 1/4¢

lots less than 1 ton.....11 1/4¢

Discounts.—V. M. French Zinc.—Dis-

counts to buyers of 10 bbl. lots of one or

assorted grades, 15; 25 bbls., 25; 50 bbls.,

45. No discount allowed on less than 10

bbl. lots.

Dry Colors.

Black, Carbon.....7 1/4¢ 7 1/4¢

Black, Drop, Amer.....3 1/4¢ 4

Black, Drop, Eng.....7 1/4¢ 11

Black, Ivory.....15 1/4¢ 21

Lamp, Con.....5 1/4¢ 8

Blue, Celestial.....5 1/4¢ 8

Blue, Chinese.....35 1/4¢ 40

Blue, Prussian.....30 1/4¢ 35

Blue, Ultramarine.....3 1/4¢ 35

Brown, Spanish.....14 1/4¢ 24

Brown, Vandyke, Amer.....8 1/4¢ 34

Brown, Vandyke, Foreign.....8 1/4¢ 34

Carmine, No. 40.....\$2.10@2.75

Green, Chrome, ordinary.....5 1/4¢ 9

Green, Chrome, pure.....18 1/4¢ 29

Lead, Red, bbls. 14 bbls. and kegs:

Lots 500 lb or over.....6 1/4¢

Lots less than 500 lb.....7

Litharge, bbls. 14 bbls. and kegs:

Lots 500 lb or over.....6 1/4¢

Lots less than 500 lb.....7

Ocher, French Washed.....14 1/4¢ 24

Ocher, Dutch Washed.....14 1/4¢ 24

Ocher, American.....\$10.00@15.00

Orange Mineral, English.....\$ 9 1/4¢ 12

Orange Mineral, French.....11 1/4¢ 15 1/4

Orange Mineral, German.....9 1/4¢ 12

Orange Mineral, American.....8 1/4¢ 8 1/4

Red, Indian, English.....4 1/4¢ 8 1/4

Red, Indian, American.....3 1/4¢ 8 1/4

Red, Turkey, English.....4 1/4¢ 8

Red, Tuscan, English.....7 1/4¢ 10

Red, Venetian, Amer. # 100 lb.....\$10.10

Red, Venetian, English # 100 lb.....1.80@2.10

Sienna, Italian, Burnt and

Powdered.....\$ 3 1/4¢ 9 1/4

Sienna, Ital. Raw, Powd.....3 1/4¢ 7 1/4

Sienna, American, Raw.....14 1/4¢ 3

Sienna, American, Burnt and

Powdered.....\$ 14 1/4¢ 3

Talc, French.....\$ 100 lb \$1.25@1.50

Talc, American.....50 1/4¢ 10

Terra Alba, French, # 100 lb.....95 1/4¢ 100

Terra Alba, English.....95 1/4¢ 100

Terra Alba, American No. 1.....45 1/4¢ 70

Terra Alba, American No. 2.....45 1/4¢ 70

Umber, Turkey, Bnt. & Pow. # 100 lb.....\$14.34

Umber, Turkey, Raw & Powd. # 100 lb.....\$14.34

Umber, Bnt. Amer.....14 1/4¢ 3

Umber, Raw, Amer.....14 1/4¢ 3

Yellow, Chrome.....10 1/4¢ 25

Vermilion, American Lead.....10 1/4¢ 25

Vermilion, Quicksilver, bulk.....87 1/4¢

Vermilion, Quicksilver, bag.....87 1/4¢

Vermilion, English, Import.....50 1/4¢ 95

Vermilion, Chinese.....58 1/4¢ 95

Colors In Oil.

Black Lampblack.....10 1/4¢ 14

Blue, Chinese.....36 1/4¢ 40

Blue, Prussian.....32 1/4¢ 35

Blue, Ultramarine.....12 1/4¢ 16

Brown, Vandyke.....9 1/4¢ 13

Green, Chrome.....8 1/4¢ 12

Green, Paris.....\$ 24

Sienna, Raw.....10 1/4¢ 13

Sienna, Burnt.....10 1/4¢ 13

Umber, Raw.....9 1/4¢ 13

Umber, Burnt.....9 1/4¢ 13

Miscellaneous.

Barytes, Foreign, # ton.....\$19.00@31.00

Barytes, Amer. floated.....19.00@30.00

Barytes, Crude.....9.00@10.00

Chalk, in bulk.....\$ 200 1.15¢ 2.25

Chalk, in bbls.....\$ 100 38¢

China Clay, English, # ton.....12.00@17.50

Cobalt, Oxide, # 100 lb.....2.26¢ 2.50

Whiting, Common, # 100 lb......42¢ .52

Whiting, Gliders......54¢ .64

Whiting, extra Gliders......59¢ .65

Putty.

In bladders.....\$1.90

In cans, 12 lb to 25 lb.....2.40

In cans, 1 lb to 5 lb.....2.50

In cans, 1 lb to 5 lb.....3.60

Spirits Turpentine.

In Southern bbls.....\$50.46

In machine bbls.....\$51

Glue.

Low Grade.....\$ 13 1/4¢ 15

Cabinet.....13 1/4¢ 16

Medium White.....14 1/4¢ 16

Extra White.....16 1/4¢ 25

French.....12 1/4¢ 25

Irish.....13 1/4¢ 15

Animal, Fish and Vegetable Oils.

Linseed, City, raw.....\$ gal. 63 1/4¢ 64

Linseed, City, boiled.....65 1/4¢ 66

Linseed, State and West'n, raw.....61 1/4¢ 62

Linseed, raw Calcutta seed.....67 1/4¢

Lard, Prime.....61 1/4¢ 63

Lard, Extra No. 1.....60 1/4¢ 62

Lard, No. 1.....60 1/4¢ 62

Cotton-seed, Crude.....35 1/4¢ 36

Cotton-seed, Summer Yellow,

prime.....39 1/4¢ 40

Cotton-seed, Summer Yellow,

off grades.....39 1/4¢ 40

Sperm, Crude.....39 1/4¢ 40

Sperm, Natural Spring.....39 1/4¢ 40

Sperm, Bleached Spring.....39 1/4¢ 40

Sperm, Natural Winter.....39 1/4¢ 40

Sperm, Bleached Winter.....39 1/4¢ 40

Whale, Crude.....39 1/4¢ 40

Whale, Natural Winter.....39 1/4¢ 40

Whale, Bleached Winter.....39 1/4¢ 40

Menhaden, Crude, Sound.....39 1/4¢ 40

Menhaden, Light Strained.....39 1/4¢ 40

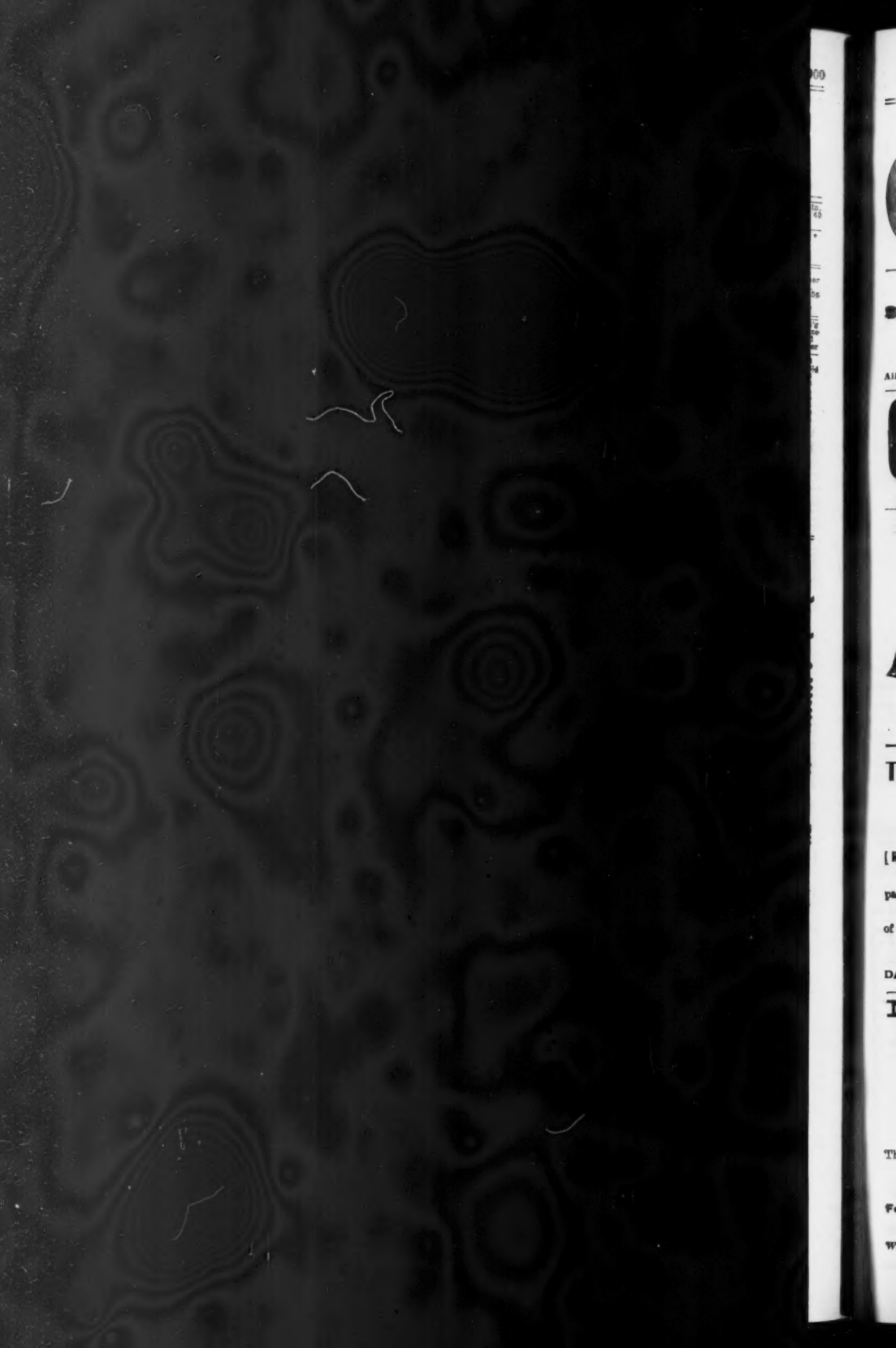
Menhaden, Bleached Winter.....39 1/4¢ 40

Menhaden, Extra Bleached.....39 1/4¢ 40

Tallow, prime

The microfilm contents of this roll were recorded as available.

Imperfections such as missing issues, missing pages, errors in pagination have been verified with the bound volume after filming.





CARY'S BOX STRAPPING.

MADE IN VARIOUS WIDTHS.

CARY MFG. CO., 19 & 21 Roosevelt St., New York.

WHY ARE WE LEADERS?

BECAUSE the largest consumers acknowledge the Superior quality of our

Scrap Copper, Scrap Brass, Scrap Lead, Scrap Zinc,
and all kinds of old Metals. Write for prices to

THEODORE HOFELLER & CO.

98, 100, 102 TERRACE, BUFFALO, N. Y.

All Metals Carefully GRADED and Made FREE of Iron.



We Lead Them All.

SCHWERTLE & SIEBERT,
STENCILS-BURNING BRANDS
STEEL STAMPS & DIES
SEALS-MACH PLATES-CHECKS
BRIDGEPORT, CONN.

WILLIAMS PRINTING CO.,
Commercial Printers and Binders.

CATALOGUES A SPECIALTY.

232-238 William Street, New York.

OURWAY IRON

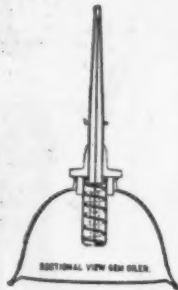
Equal to Best Swedish and Norway.

BROWN & CO., INC.,
PITTSBURGH, PA.

ESTABLISHED 1825.



Did you order the—
Gem Oiler?
Bear with us a bit—
We're slow in filling, but—
Can't help it—
Didn't know people would
take to Gem Oiler so—



GEM MANUFACTURING CO.,

200, 202 Wood St.,
Pittsburg, Pa.

The Standard Hardware Lists For Pocket, Desk and Price Book Use ELEVENTH EDITION.

[Revised to Date of Purchase. Enlarged to 129 Pages. Containing Over 300 Lists.

These lists are printed on thin paper of good quality and on only one side of each page, so that they may be cut out and inserted in price books.

The Standard Hardware Lists is an indexed book equally convenient for purpose of reference.

BOUND IN FLEXIBLE CLOTH COVER. PRICE, ONE DOLLAR, POSTPAID.

DAVID WILLIAMS COMPANY, Publishers, 232-238 William St., N. Y.

MORRILL'S Perfect Saw Sets. Bench Stops, Punches, Cutting Pliers and Car Sealers.

THE NO. 1 SAW SET.



Registered, Pat. No. 80572.

This Trade Mark is stamped on all Hardware Specialties of my make.



NO. 1 IMPROVED.



Registered, Pat. No. 80572.

This Trade Mark is stamped on all Hardware Specialties of my make.

For Hand, Band and Jig Saws, from the widest made down to 1-2 inch. The Sets are too well known for me to enlarge on them.

Write for Catalogue. **CHARLES MORRILL, Broadway Chambers, Broadway and Chambers' St., N. Y.**

The GEM
NAIL CLIPPER,
CUTS,
CLEANS,
FILES.



Mounted 12 on card like the illustration. They make an attractive show and sell like hot cakes.

SAMPLE BY MAIL, 25 CENTS.

IT IS A PRACTICAL MANICURE.

Perfect for removing hang nails. Send for circular and prices.

H. C. COOK & CO.,
ANSONIA, CONN.

New York Office:
Smith & Hemenway Co., 296 B'dway, New York.

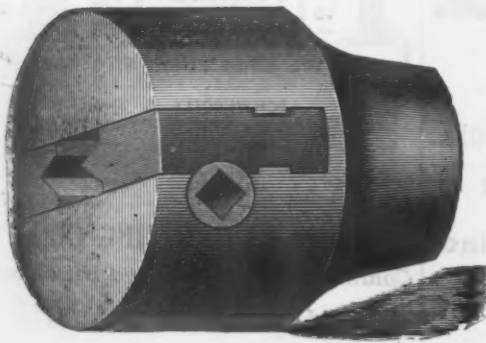
REID DRILL CHUCKS.

THREE SIZES.

No. 0 takes any drill from 0 to 1-2 inch inclusive.

No. 1 " " " " 0 " 3-4 " "

No. 2 " " " " 0 " 1 " "



They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

SEND FOR CIRCULAR.

R. H. BROWN & CO., - New Haven, Conn.

*You cannot run on the quality
We manufacture the best!*



SAND PAPERS
IN
Reams and Rolls

**Flint Paper
Carnet Paper
Emery Paper
Emery Cloth**

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

BAEDER, ADAMSON & Co.

730 MARKET STREET, PHILADELPHIA.
67 BECKMAN STREET, NEW YORK.
243 MILK STREET, BOSTON.
982 LAKE STREET, CHICAGO.

CHAMPION EGG OPENER.



NEW WAY

A perfect working article, once used never without. Gives perfect satisfaction. No daubing or pieces of shell by using this Egg Opener. No competition: fast seller and a money maker. Nickel Plate, 25c.; Silver Plate, 50c. Send for discount on large quantities to

PATENTED JAN. 4, 1887.
State Iron Age. W. R. HARTIGAN, Collinsville, Conn.

JOHN LOYD



Machine Knives, Shear Blades,
Presses and Dies.

Nos. 550 to 562 Water Street, New York.

POWER HACK SAW



One Star Hack Saw Blade used in this machine will cut off an inch square bar of steel one hundred times. It cuts all sizes up to $4\frac{1}{2}$ inches, round or square.

Price of Machine, \$25.

MILLERS FALLS CO., 28 Warren St., New York, U. S. A.

Steel Giant Grubber.

One of the most useful implements yet invented. With this machine you exterminate the Sapling, Grub or Bush, as it lifts it out of the ground, root and body.

A GREAT LABOR SAVER.

Does the work of five men.
Send for particulars and testimonials.

New Century Manufacturing Co.,

48 East 8th Street, New York.



**SAMSON SCREW DRIVERS
BITS ARE O. K.**
Send for catalogue of tools to
SAWYER TOOL CO., - Fitchburg, Mass.

How about SCALES?

LET US
quote you prices on our line of—
**TEA SCALES,
COUNTER SCALES,
BUTCHERS' SCALES.**

Our small scales are in great demand at this
season for household purposes.



NEW YORK,
PHILADELPHIA,
CHICAGO.

READING HARDWARE CO.,
READING, PA.,



Drake's Adjustable Burner

Can be turned down from a full size flame to one candle power by means of the little valves, one of which may be closed entirely and the other one reduced to a flame as small as desired for a night light without smoking, carbonizing or producing a sluggish flame.
The diverging stems are so arranged that they can be turned into alignment in an instant.
The points of the little valves may be forced up through the little hole where the gas is liberated from the rear, removing any obstruction without being obliged to extinguish the whole flame.
Patents pending in the United States, Canada and Principal Countries of Europe.

Manufactured and For Sale only by the

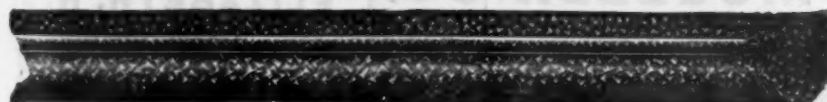
DRAKE ACETYLENE APPARATUS CO.,
OR ITS AGENTS,

33 Hathaway Street, CLEVELAND, O.

BERGER BROS. CO.



Manufacturers of **PIPE AND CUTTER.**



Factory near Germantown Junction, Phila.
Office and Storerooms, 231 and 237 Arch Street.

BERGER BROS. CO., PHILADELPHIA.

METAL CEILINGS and SIDEWALLS.
METAL LATH, STEEL BRICK,
ROCK FACED METAL,
METAL TILE or SHINGLES.

CORRUGATED SHEETS, STANDING SEAM, V CRIMPED OR
ROLL STEEL ROOFING.

Any of the above in Painted or Galvanized, No. 28 to No. 18 Gauge.

THE PENN METAL CEILING & ROOFING COMPANY,
(LIMITED.)

18 to 24 Harcourt Bldg.,
BOSTON, MASS.

23d and Hamilton Streets,
PHILADELPHIA, PA.

Samples and Catalogues on Application.



MONCE'S NOVELTY GLASS CUTTERS. INTERCHANGEABLE LOCK STENCILS

No. 1 Cutter, born 1871, and has been worthy of extensive imitation, that is why I keep it before you.
We make others. S. G. MONCE, UNIONVILLE, CONN.

Clark Expansive
AND

**WRIGHT'S
Jennings
BITS.**



Warranted.

Conn. Valley Mfg. Co.,
CENTERBROOK, CONN., U. S. A.

TRY

Mugford's Half Tones,
Wood Cuts and Electrotypes.

"You See Them Everywhere,"

A. MUGFORD,
ENGRAVER and ELECTROTYPYER,
HARTFORD, CONN.

New York Office, 120 Liberty Street.

**A Nozzle,
An Arc Sprinkler,
A Regular Sprinkler**

ALL COMBINED
IN ONE...



15 Styles
Nozzles
and
Sprinklers

—ALSO—

Menders
and Sleds.

Manufactured Exclusively by

Crescent Brass & Iron Co.,
DETROIT, MICH.

Write for 1900 Catalogue.

Are you like other men? Do you want the best for your money?
Then in buying **SAWS** be sure you get



THE ATKINS.

H. C. ATKINS & CO., MFRS.,
INDIANAPOLIS, IND.

MEMPHIS, TENN.

ATLANTA, GA.

MINNEAPOLIS, MINN.



HIS SUCCESS
IS LARGELY DUE
TO THE SALE OF
**SIMONDS
SAWS**

Simonds Mfg. Co.,

Simonds Mfg. Co., Ltd.,
New Orleans, La.

NEW YORK, N. Y. PORTLAND, ORE.
FITCHBURG, MASS. CHICAGO, ILL. SEATTLE, WASH.

Simonds Saw Co.,
San Francisco, Cal.

BRAUNSDORF-MUELLER CO., **SMALL TOOLS**
FOR THE BEST TRADE.
ELIZABETH, N. J.

Conductors'
Punches,
Bird
Cages,
Flower
Stands,
and all
Kinds Wire Work,

MANUFACTURED BY
FRED. J. MEYERS MFG. CO.,
HAMILTON, O.
WRITE FOR PRICES.

HAND SAWS.

Send for Prices.

THE NATIONAL SAW CO.,

Newark, N. J.

LEAD WASHERS
They Positively Prevent Leakage and Rust at Nail Head, thus making a Perfectly Water Tight Joint and more durable job.
Liberal discount to the Hardware and Roofing Trade. Send for special Circular A and prices.
LITTLEFORD BROS., Sole Mfrs., 300-302-304 E. Pearl St., CINCINNATI, O.

SLAW AND CROUT CUTTERS.

Made from Well Seasoned Cherry Lumber.

Hardened and Tempered Crucible Steel Blades.



Turnip or Potato
Shredder.

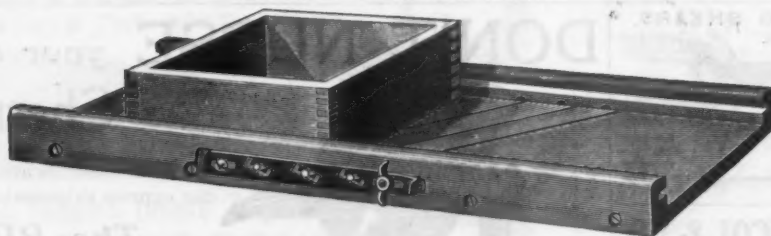
THE MOST
DURABLE

CUTTERS ON THE
MARKET.



SLAW CUTTERS.

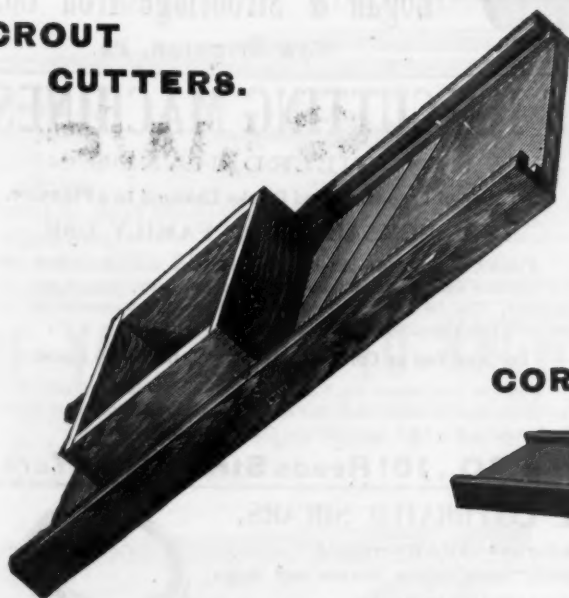
ADJUSTABLE CROUT CUTTERS.
PATENT APPLIED FOR.



This cutter is very simple in construction and can readily be adjusted to any cut by loosening thumb screws on sides, moving slides backward or forward as required.

WRITE FOR NEW CIRCULAR AND PRICES.

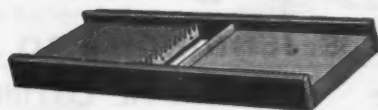
**CROUT
CUTTERS.**



**TWO-KNIFE
SLAW CUTTER.**



CORN GRATER.



HENRY DISSTON & SONS, Inc.,

Keystone Saw, Tool, Steel & File Works,
PHILADELPHIA, PA.

SEND FOR CATALOGUES.

Bicycles.

Sewing

Machines.

Bicycle

Sundries.

Lawn

Mowers.

Season 1900.



SUPPLEE HARDWARE CO., Philadelphia, Pa.

POPULAR

*Absolutely Even
Tempered and
Hardened.
Large Variety of
Styles.*

PRICE GUARANTEED RAZORS.

The best line for the Hard-
ware Dealer.

Let us quote
you prices.



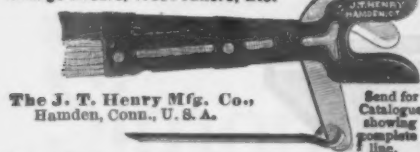
Swedish Razor Co.,

Worcester, Mass., U. S. A.

Swedish Razor Co.

HENRY'S PRUNING SHEARS.

Orange Shears, Tree Pruners, Etc.



The J. T. Henry Mfg. Co.,
Hamden, Conn., U. S. A.

Send for
Catalogue
showing
complete
line.

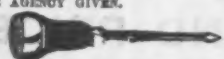
NICOL & CO.

Manufacturers of

**SPECIAL AND LIGHT
HARDWARE.**

EXCLUSIVE AGENCY GIVEN.

67 W. Washington St.,
Chicago, Ills., U. S. A.
Established 1890.



THE BEST KEY-HOLE SAW HANDLE

IS THE



NEVER SLIP.

W. C. LADD, Maker, Bristol, Conn.
WRITE FOR PRICES.

DON'T NURSE your orders for Cherry Seeders

until the cherries are ripe and then telegraph
for express shipments. Freight is cheaper.

The BRIGHTON

is the best machine made. Strong and
Substantial.

Two Styles—Japanned and Tinned.

MADE BY

Logan & Strobbridge Iron Co.,
New Brighton, Pa.



CHANDLER'S ICE CUTTING MACHINES

NO CHILLED HANDS.

The Labor of Preparing Iced Drinks Changed to a Pleasure.

INDISPENSABLE FOR FAMILY USE.

A small, compact, simple, strong and cheap machine, which cuts
the ice into small diamond shaped pieces with the utmost ease and
rapidity. Can be attached by screws to any table, counter or shelf
and occupies a space only eight inches square.

For Iced Tea or Coffee or Ice Cream, It Has no Equal.

Made in four sizes: No. 1 for Bar Tops and Soda Counters; No. 2
for family and universal use; No. 2½ for Hotels, Hospitals and Board-
ing Houses; No. 3 for large Hotels, Confectioners, etc.



C. E. JENNINGS & CO., 101 Reade Street, New York.

THE NATIONAL CELEBRATED SHEARS.

A Complete Line and Fully Warranted.

Trimmers, Scissors, Tinner's Snips, Dental Shears and Snips.

WE SELL TO JOBBERS ONLY.



**NATIONAL CUTLERY CO., 3d St. and Lehigh Avenue,
PHILADELPHIA, PA., U.S.A.**

What You Need

is a cash system that will enable you to

*know
exactly
what
you
are
doing.*



We will tell you what we have if you will
write for illustrated catalogue.
HOUGH CASH RECORDER CO.,
Indian Orchard, Mass., U. S. A.

SEND FOR CATALOGUE.

"Stamped with the Buck's Head" and
warranted to give satisfaction in use.



Send for Price List No. 8,
And **TRY OUR RAZORS.**

BUCK BROTHERS, - Riverlin Works, - MILLBURY, MASS.
HIGHEST AWARD PARIS EXPOSITION, 1889.



ESTABLISHED 1837.

INCORPORATED 1892.

THE L. & I. J. WHITE CO.,
BUFFALO, N. Y.

MANUFACTURERS
OF**EDGE TOOLS.**

Coopers', Carpenters' and Ship Tools, Plane Irons,
Cleavers, &c. Full Line Chisels.

New York Office, 45 Centre St.

75 YEARS.

ESTABLISHED 1825.

75 YEARS.

CELEBRATED **HEINISCH** SHEARS
ACKNOWLEDGED THE BEST.



Tailors' Shears, Trimmers, Scissors, Tinners' Snips, etc.

R. HEINISCH'S SONS CO.,

New York Office, 90 Chambers Street.

NEWARK, N. J.

NOT CONNECTED WITH ANY SHEAR COMBINATION.

Charles Buck, Millbury, Mass., U. S. A.
MILLBURY EDGE TOOL WORKS.



I MAKE A
SPECIALTY OF
CARVING TOOLS.

CHISELS,
COUGES,
CUT and DOUBLE
IRONS,
SCREW DRIVER BITS,
REAMERS,
CUPPED NAIL SETS, ETC.

Also a Full Line of **RAZORS,**

Hand Forged, Hand Ground, made of Best
English Steel, branded **CHARLES BUCK.**
All goods Fully Warranted.

SEND FOR CATALOGUE.

IF YOU WANT TO KNOW ASK US

How to file catalogues, quotations and every class of data, with no more trouble to
file than to throw in the waste basket, and as easy to get when wanted as
though in your vest pocket.

FOLDING PAPER BOX CO., South Bend, Ind.



THE CELEBRATED FOX
NO. 44

All . . .

Fox Razors

ARE MADE BY US.

Every Fox Razor honed and in-
spected the day we ship it.

We repair, grind, hone and handle razors. Write us.

FOX CUTLERY CO.,

Write for new catalogue to

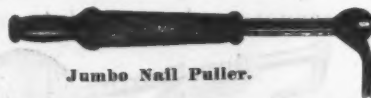
Dubuque, Ia., 925 Main St. New York City, 48 Centre St.

**THE CELEBRATED
RED SEAL SHEARS.**

MANUFACTURED ONLY BY

THE ACME SHEAR CO.,

BRIDGEPORT, CONN.



Jumbo Nail Puller.

Solid Steel Pliers, Wire Cutters, Nail Pullers,
Ticket Punches, Shears, Scissors, etc. Cast, Sheet
Metal or Drop Forged specialties to order.



THE "GLENDALE."

THE BRIDGEPORT MFG. CO.

BRIDGEPORT, CONN.

The
"ORIGINAL
JENNINGS"
AUGERS and
AUGER BITS.



Genuine have)
"Russell Jennings"
stamped in full
on the Round of
each Bit.

FOR SALE BY ALL HARDWARE JOBBERS.

The Russell Jennings Mfg. Co., Deep River, Ct., U. S. A.

Established 1774.

HIGH
GRADE **AUGER BITS.**
(BLACK TWIST)

JOB T. PUGH, PHILADELPHIA:

THE
Ford Ship Augers.

SECOND TO NONE.

Prices Right.

THE FORD BIT CO.,
HOLYOKE, MASS.

Amerlean Tool Chest Company,
NEW YORK.
MANUFACTURERS OF

TOOL CHESTSOf all sizes, complete with tools, for Hardware, Toy,
Notion and Variety trades.

Factory and Saleroom,

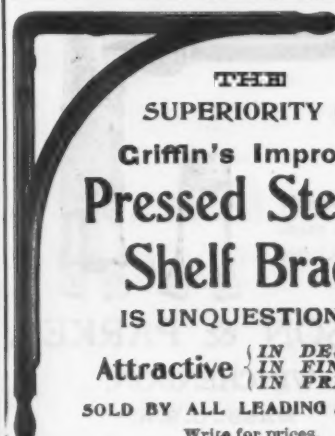
200 West Houston Street, near Varick.

Also Machinists' Tool Chests, empty. Tool Cabinets
and Work Benches. Illustrated Catalogue
and prices furnished on application.**NOT IN THE COMBINATION.**

Write for prices on

Mrs. Potts Sad Iron Handles.**M. SCHRAYER'S SONS & CO.,**

49 Blue Island Ave., Chicago, Ills.



THE
SUPERIORITY OF

Griffin's Improved
**Pressed Steel
Shelf Bracket**

IS UNQUESTIONED.

Attractive { IN DESIGN,
IN FINISH,
IN PRICE.

SOLD BY ALL LEADING JOBBERS

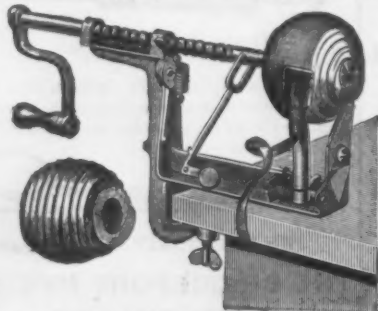
Write for prices.

THE GRIFFIN MFG. CO., - Allegheny, Pa.

1864—Thirty-Six Years—1900.

We have had an experience of thirty-six years in manufacturing Apple Parers and think we are safe in saying, we make a larger variety and more than all others combined.

We make machines to pare, pare and core, and pare, core and slice, for hand and power, varying in retail price from below \$1 to \$20 each and if there is a real demand for an Apple Parer we cannot supply we don't know it.



This cut represents our White Mountain Parer, Corer and Slicer, a first-class family machine at a small cost. It is stronger and better than any one of the imitations, and don't cost any more.

We make a specialty of Apple Parers for Evaporators.

Catalogue Free.

New York Office, 10 Warren St.

GOODELL CO., - ANTRIM, N.H.

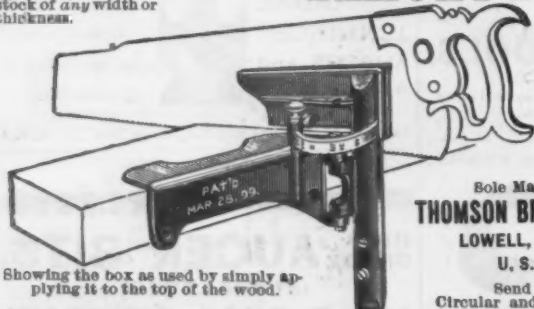
With it you can cut stock of any width or thickness.

SEAVEY'S

MITRE BOX, Improved.

Weights 2 lbs. No special saw needed

Simple,
Light,
Accurate,
Low Priced.



Showing the box as used by simply applying it to the top of the wood.

Sole Manufs.,
THOMSON BROS. & CO.,
LOWELL, MASS.,
U. S. A.

Send for Circular and Discount.



Showing the box as fastened to bench or horse, with stock in position to be cut.

Send for our Catalogue OF HARDWARE SPECIALTIES

Garden and
Floral Tools,
Mincing Knives,
Indestructible
Steel Toys, etc.



Plain and
Ratchet
Bit Braces.

Largest variety
of braces made
in the United
States.

MASON & PARKER,
WINCHENDON,
MASS., U. S. A.

JOHN H. GRAHAM & CO., Agents,
115 Chambers St., N. Y.

AGRICULTURAL IMPLEMENT CHAINS



(EUREKA WELDLESS STAY CHAIN.)

Our NIAGARA and EUREKA Weldless Chains are now largely used for manufacturing purposes. They give good satisfaction and the prices are low. Ask your jobber for them. Complete catalogue on application.

ONEIDA COMMUNITY, Limited, Niagara Falls, N. Y., U. S. A.

FRAY'S Spofford Braces.

ALSO MANUFACTURERS OF

Hand and Breast Drills,
Chucks, Pin Vises, Hol-
low Handle Tool Sets,
Etc.

Send for Catalogue.

John S. Fray & Co.,
BRIDGEPORT, CONN., U. S. A.



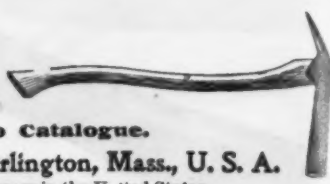
SUMMER ICE TOOLS.

Ice Tongs, Ice Axes, Saws, Scales.

Send for 1899-1900 Catalogue.

WM. T. WOOD & CO., - Arlington, Mass., U. S. A.

Largest and oldest Ice Tool Manufacturers in the United States.



THE "OLD RELIABLE" STAR ★ BRAND.

NEW CENTURY PATTERN.

TRADE MARK

★ ROGERS & BRO. A-1.



The New Century is our latest design and is made in the complete line of staple and fancy pieces. Send for Booklet.

INTERNATIONAL SILVER CO.,
SUCCESSOR TO

ROGERS & BROTHER,

New York: 9, 11, 13, Maiden Lane.

WATERBURY, CONN.

The Simplex
Time Recorder

For use in Factories, Stores, Offices and wherever a record of the time of arrival and departure of employees is required.

Registers by the push of a button—nothing more.

Sent on 30 days' trial.

For prices and full description write our nearest office, stating number of your employees.

Factory, Gardner, Mass.

Chicago, 272 Wabash Ave.

SIMPLEX TIME RECORDER CO.,

SUCCESSORS TO

HEYWOOD BROTHERS and
WAKEFIELD COMPANY.

"Chicago" Autograph
Time Recorders.

Give Absolute Security to
Your Pay Rolls.

The employee registers by SIGNING HIS NAME. The Recorder PRINTS the TIME opposite the space for signature, and where IT CAN BE EASILY SEEN while signing.

A PERFECT means for keeping CLOSE TIME on PIECE or JOB work.

A system that CANNOT BE BEATEN.

The "CHICAGO" is the ONLY RELIABLE AUTOGRAPH RECORDER EVER made.

We also make a KEY RECORDER.

WRITE FOR CIRCULARS. They tell all about both kinds.

See our exhibit in American section of Furniture Building, Exposition des Invalides. Apply to Franco-American Co., 162 Ave. Parmentier, Paris.



Chicago Time Register Co.,

11 South Water St., Chicago.

Branches—189 Broadway, New York.
911 Girard Bldg., Philadelphia.
348 Markham St., Toronto, Canada.
5 Bradford Ave., Redcross St., London, E. C.

GARLAND CHAIN CO., RANKIN STATION,
PA., U. S. A.,

QUALITY, THE BEST.

PROMPT SHIPMENTS.



Galvanized Pump Chain.

GALVANIZED AWNING RODS.



Coil Chain, Self Colored and Galvanized.

New York Sales Agents, HENDRICKS & CLASS, 150 Nassau Street.

Southern Sales Agents, WIER & WILSON, Baltimore, Md.

JACK IRON
BRASS

Send for **CHAIN**
Price.

WE MAKE NOTHING ELSE.

HALE BROS., Worcester, Mass.

"BOSTON" AUTOMATIC

ICE

Makes a clean break and
does not waste the ice.

PICK

Send for Circular
and Price.

DODGE MACHINE SCREW CO., - BOSTON.



"NEVER-BREAK" Best Finished Goods Made.

Always sweet and clean. FULL WEIGHT.

Will not absorb grease. STUBBS GAUGE.

Steel

Shovels,
Scoops,
and Spades.

Spiders, Kettles, Griddles, Stew Pans,
Scotch Bowls, HIGHLY POLISHED
AND TINNED.

CATALOGUE UPON APPLICATION.

THE AVERY STAMPING CO., - - CLEVELAND, OHIO.

J. C. McCARTY & CO., 10 Warren Street, New York, Representatives.

MORLEY BROTHERS
 MANUFACTURERS OF **SAGINAW, MICH.** ESTABLISHED 1863
 THE CELEBRATED BLUE LINE LUMBERING TOOLS.

Write to-day for our latest
ILLUSTRATED CATALOGUE.
 Your address on a postal card will bring it.

Blue Line Tools have been the standard among loggers everywhere for over a quarter of a century.

Why sell an inferior tool claimed to be "as good as the Blue Line," when you can have the genuine?

THE LUFKIN RULE CO.

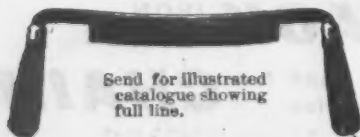
Measuring Tapes
 OF EVERY DESCRIPTION.
 Steel, Metallic, Linen, Pocket, Ass Skin, Pat. Leather, Bend Leather, &c.

THE LARGEST AND MOST POPULAR LINE IN THE MARKET.
 Send for Catalogue.

SAGINAW, - MICH., U. S. A.

N. Y. City Office and Store, 290 Stewart Bldg.

C.J. Kimball Co. **KNIVES**



Send for illustrated catalogue showing full line.

Bennington, N. H.,
 U. S. A.

SHOE, BUTCHER and KITCHEN CUTLERY,
 CARPENTERS' DRAWING KNIVES, SCREW DRIVERS, ETC.



No. 96. Round (Embossed) Hardwood Handle.



For Export and Domestic Trade,

We Make
BLIND FASTENINGS, BLIND HINGES,
 In a variety of Styles.

Shutter Hinges, Shelf Brackets, Gate Hinges and Latches
 In Several Styles.

"Niagara," "Star," "Acme," and "Gem" Frame Pulleys,
 Polishing Irons, Casters, Well Wheels, Hayfork Pulleys, Hatchets,
 Hammers, Hooks, Thumb Latches, Sash Lifts, Drawer Pulls,
 Chest Handles, Grindstone Fixtures, Floral Tools, Iron Penny Toys, &c., &c., &c.

We are makers of many of the goods formerly made by the Shepard Hdw. Co., whose interest in the lines we acquired by purchase.

SEND FOR CATALOGUE.

Wrightsville Hardware Co., Wrightsville, Pa., U. S. A.
 New York Agents, ADDER & BOYD, 37 Warren St.

MADE IN 2 SIZES.



600 Series Tea Kettles.

"ROME"

NICKEL PLATED COPPER WARE.

Tea Kettles, Range Kettles, Tea and Coffee Pots, Trays, Pitchers, Serving Dishes, Insets, Wash Basins, Wash Boilers, Tea Sets, Dippers, Cups, Stove Tanks, Cuspidors, Etc.

COPPER AND BRASS SPECIALTIES.

The making of Copper and Brass Specialties will be considered at all time provided the articles can be manufactured in quantities.

Have you our latest catalogue? If you handle Nickel Plated Ware you need it. Write us and let us quote you prices.

ROME MANUFACTURING CO., ROME, N. Y., U. S. A.

The Model Stove Truck is out of sight when under a stove.

We offer to take back and refund money, if, after a month's trial, the Model is not satisfactory.

THE
S. M. HOWES CO.,
BOSTON, MASS.



IS ALL STEEL,
HAS ONLY ONE
ADJUSTMENT,
IS PRACTICALLY
INDESTRUCTIBLE.

Send for Circular and Price.

Plain Screwdriver Bits. 2 Sizes, Nos. 90 and 100



German Pattern Bits, Double-cut Bits, Gimlets, Electricians' Bits and Gimlets, Nail Sets, Reamers, Etc. Send for catalogue and prices.

F. H. PERRY & CO., Manufacturers,

Chester, Conn.



THE TRADE acknowledges our make of **BUTCHERS' STEELS**
THE BEST IN THE WORLD.

FOR CATALOGUES AND PRICE-LISTS ADDRESS

C. & A. HOFFMAN, Manufacturers, FRANKFORD, PHILA., PA.

In POCKET KNIVES it always pays to BUY THE BEST.



We make that kind. Over 500 attractive styles. Hand-Forged, Tested and Warranted.

NORTHFIELD KNIFE CO., Northfield, Conn.



R. BLISS MFG. CO.,
PAWTUCKET, R. I.,

have just issued a catalogue of
WOOD HARDWARE and SPECIALTIES,
WOOD TURNINGS of every description,
MILL SUPPLIES,
CARPENTERS', MACHINISTS' and
JEWELERS' TOOL CHESTS,
FIELD CROQUET,

WOOD HANDLES
ETC.

Catalogue Free.

NEW ENGLAND SPECIALTY CO.

NORTH EASTON, MASS.

Screwdrivers, Can Openers, &c. Sheet

Metal Punching and Nickel-Plating.

Mill Supplies, Steel Springs of all kinds.



If it is your desire to carry the line of Oak Mantels that sells on sight makes you kindly remembered by patrons and brings a good profit, our

CABINET MANTELS

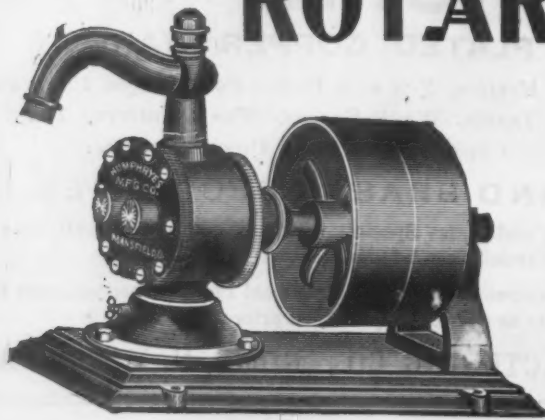
fill the bill to perfection. There's a lifetime experience behind each one we sell.

C. B. ATKIN, Mfr.,
Knoxville, Tenn.

Send for Catalogue.

First Principles of Electricity and Magnetism. A book for beginners in practical work. Containing about 850 illustrations and diagrams. By C. H. W. BROS. 13mo, cloth, \$3.00. For sale by David Williams Co., 232 William St., N.Y.

ROTARY FORCE PUMPS



H 704.

WE MAKE THESE FOR PUMPING
COLD OR HOT WATER, OIL, BEER
AND ACIDS. Write for Prices.

CISTERN,
PITCHER,
WIND MILL,
D A FORCE,
SET LENGTH,
HORIZONTAL,
ANTI-FREEZING
PUMPS,
HYDRAULIC RAMS,

WE ALSO MAKE

CAST IRON SINKS,
SOIL PIPE AND FIT-
TINGS, :
GARDEN AND FIRE
ENGINES,
IRON AND BRASS
PUMP CYLINDERS,
PLUMBERS' IRON
WARE, ETC.

THE HUMPHRYES MFG. CO.,

Mansfield, Ohio.

EDSON'S SYSTEM FOR THE ODORLESS DISPOSAL OF CESSPOOL MATTER.



Being extensively used in Cuba under
direction of the United States Gov-
ernment.

Send for illustrated booklet.

EDSON MFG. CO.,

184 COMMERCIAL ST.,

Boston, Mass., U.S.A.



PUMPS

Iron Hand and Wind Mill.

SINGLE and DOUBLE
ACTING PUMPS
for all purposes.

CAST IRON SINKS,
SINK BRACKETS.

SEND FOR CATALOGUE,

The Barnes Mfg. Co.,
MANSFIELD, O.



Red Jacket

SPRAY PUMP

IS THE BEST
FOR GENERAL USE.

WE MAKE
ALL KINDS OF
PUMPS,

House Force,

Set Length,

Deep and

Shallow Well.

ALSO

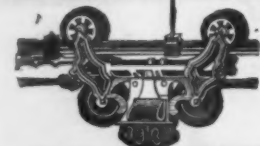
HAY TOOLS.

Get Our Prices.

RED JACKET MFG. CO., - Davenport, Iowa.



CATALOGUE FREE



GET OUR
REDUCED PRICES

F. E. MYERS & BRO.

PH. 84.25

ASHLAND, OHIO.

WELL TANK & SPRAY PUMPS

HAY CARRIERS,
FORKS, PULLEYS & C.



STAR WIND MILLS,

All Kinds and Sizes.
"Hoosier" and "Fast Mail" Iron Pumps.

Secure the Agency for 1900.

Galvanized Steel Star Back Geared Wind Mills.

Galvanized Steel Star Direct Stroke Wind Mills.

Galvanized Steel Power Wind Mills.

Wood Star Wind Mills.

Water Tanks, Wood or Steel.

Tubular Well Tools, Valves, Tubular Well Points, Drive Well
Points, Working Barrels, Hose and Hose Goods, Pipe and Fit-
tings, Hydrants and Street Washers, all kinds of Water Supply
Goods.

Estimates and advice furnished on Steel Sub-Structures work
of all kinds.

Largest and finest equipped factory in America for this class
of goods.

Inquiries respectfully solicited. Catalogue with discount
sheet mailed on application. Address

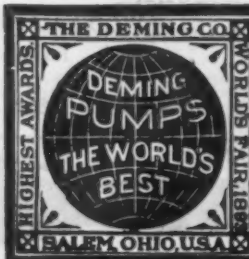
FLINT & WALLING MFG. CO., 50 Oak St., Kendallville, Ind.



FREE SAMPLES

U.S. INFALLIBLE METAL POLISH

THE ONLY METAL POLISH POSITIVELY
FREE FROM ACID OR GRIT. WRITE
GEO. W. HOFFMAN,



PUMPS ILLUSTRATED IN

General Catalogue.—Hand, Wind Mill and Power
Pumps, Hydraulic Rams, Well Supplies, etc.

Power Pump Catalogue.—Patent Triples and other
Power Pumps, for Water Works, Mines, Factories, etc.,
for Gas and Gasoline Engine, Electric Motor, etc.

Spray Pump Catalogue.—Bucket, Knapsack and Bar-
rel Sprayers; patent Kerosene Sprayers, Bordeaux and
Vermorel Nozzles, etc.

HENION & HUBBELL, Gen'l Western Ag'ts, Chicago.



"Mamma says she wouldn't keep house without the FLY KILLER."

The Bigelow Wire Fly Killer.

PATENTED JAN 8, 1895.

No Household is Complete without it.

Kills but does not crush the Fly.

SO NICE!

SO SURE!

SO CLEAN!

It's a necessity, it's a comfort in all homes, sick rooms, hospitals, sanitariums, offices, etc. Testimonials from thousands of housekeepers, and doctors recommend the killer highly.

QUICK SELLERS.

GOOD PROFITS.

TRADE SAMPLE FURNISHED UPON APPLICATION.

Send for Illustrated Booklet. Just Let Me Post You on Prices.



500,000 SOLD LAST SEASON.

J. F. BIGELOW, MANUFACTURER, WORCESTER, MASS.

ASK FOR CATALOGUE 33-E.

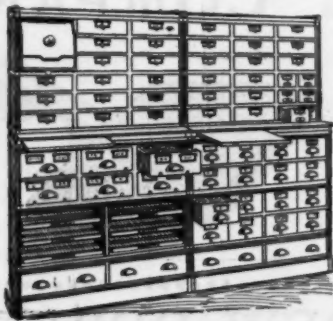
The Globe-Wernicke Co.

CINCINNATI.

NEW YORK.

CHICAGO.

BOSTON.



"G-W" pays the freight.

"ELASTIC" CABINETS

Grow, expand, keep pace with your business—a system of units fitted with the best and latest devices for filing, classifying and indexing business papers. Additional units of any kind can be had at any

time. The only correct up-to-date filing cabinet system made. Described in catalogue 33-E.

Also "Elastic" Book-Cases, Card Indexes, Desks.



COPPER

FORCE,

WELL,

CISTERN

AND

AIR CHAMBER

PUMPS.

S. WILDER & CO.,
HOLLISTON, MASS.,
U. S. A.

Send for Catalogue and Prices.



SUCTION AND FORCE

Check Valve.
Hose Nipple.

A full line containing several improvements.

Send for Circulars.

P
U
M
P
S

Athol Pump Co.,
Athol, Mass.,
U. S. A.

PROFITABLE
RESULTS

ARE OBTAINED
BY ALL DEALERS
WHO SELL

...THE UNEXCELLED...

NOVELTY PUMPS

Novelty Force Pumps for Wells or Cisterns are standard pumps of the world and for 18 years they have held an enviable reputation. The Novelty House Pump (for elevating water) is perfection. If you desire making money on pumps write us. Our prices will interest you.

HESS, SNYDER & CO., - Massillon, Ohio.



No. 13.

House Pump.



CLEVELAND GALVANIZING WORKS,
CLEVELAND, OHIO.

MANUFACTURERS OF

White Metal Pattern Letters and Figures.

PUMP CHAIN, RUBBER BUCKETS,

Lightning Rod Fixtures.

General Galvanizing and Job Machine Work.



NORTON
MFG. CO.

Chester, Conn.,

U. S. A.

GERMAN GIMLET - -
DOUBLE CUT GIMLET
SCREW DRIVER - - -
BELL HANGERS' - -

BITS.

SEND FOR CATALOGUE.

AGENTS: { Allerton Clarke Co., New York.
Ransom Rice, Chicago.
McMillan & Sloan, Chicago.

L



AERATING PUMP

PURIFIES AND SWEETENS

FOUL and offensive cistern water and makes it healthful and delightful to use.

RESTORES THE
FREE OXYGEN

To stagnant water. Forces air into the cistern which agitates and chemically affects the water, makes it like fresh fallen rain. Remarkable results. Perfect in construction. Durable. Endorsed by physicians.

Sandwich Enterprise Co.,

D. K. CROFOOT, Assignee,
70 Main Street, Sandwich, Ill.

TOOL HANDLES. INK STANDS.

Wood Turnings.

Send for Prices.

Frederick W. Sillman, Chester, Conn.

GOODELL

Automatic Screw Drivers



DRIVE
SCREWS.

Some Kinds Don't.

GOODELL-PRATT COMPANY,
GREENFIELD, MASS., U. S. A.

NEW YORK STAMPING COMPANY,

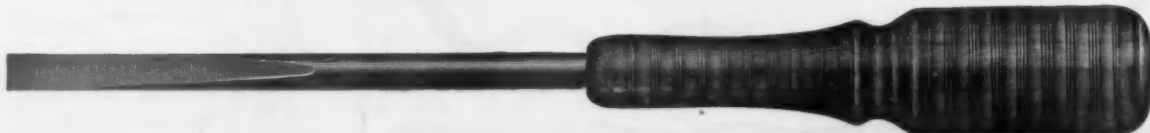
North 11th and Berry Streets, BROOKLYN, N. Y., U. S. A.

Manufacturers of Pressed and Stamped Steel Ware Specialties. Sole makers of the Eclipse Brand Curry Combs, made of the Finest Cold Rolled Steel, in great variety of styles and sizes, and of superior quality and finish, and salable in all the markets of the world; also makers of Fine Polished Steel Cooking Utensils, including the Famous Acme Frying Pans. Catalogue free on application.



LEATHER HANDLED SCREW DRIVERS.

BUFFALO BRAND.



These handles are built on the drivers, one layer of leather at a time, and are *absolutely inseparable and indestructible*.

These drivers are made from the highest grade steel and are *hand forged and tempered*, and in every respect high class tools which we fully warrant.

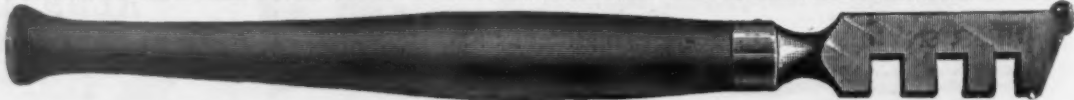
Manufacturers of Hardware Specialties.

Send for circular.

BUFFALO SPECIALTY MFG. CO., Buffalo, N. Y., U. S. A.

Barrett's Glass Cutters Standard

Barrett's Practical Glass Cutters are the standard the world over. Sold by mere Hardware Dealers than all



other makes combined. Send for prices and sample. W. L. BARRETT, Manufacturer, Bristol, Conn., U. S. A.

"Old reliable"
double action

RATCHET SCREW DRIVER

Combines greater strength, convenience and durability than can be obtained in any common driver.

Gives perfect satisfaction and sells readily.

Send for price-list.



GEO. E. GAY, Augusta, Maine, U. S. A.

Successor to Gay & Parsons.

JOHN H. GRAHAM & CO., Agents, 113 Chambers St., New York City.

SUPERIOR SHIP AUGERS AND SHIP BITS.



MANUFACTURED BY

SNELL MFG. CO., - - - FISKDALE, MASS., U. S. A.

General Agents, J. H. Graham Co., 95 Reade Street, New York. Underhill, Clinch Co., 94 Chambers Street, New York

Points on Pocket Knives

WORTH YOUR CONSIDERATION.

The secret of our success is that we use only the best materials and most skilled workmen. We stamp all goods with our own name, which is a guarantee of QUALITY.



Each knife is made with the one idea to see how good a knife we can make for the purpose for which the knife is intended.

See article in this issue on the manufacture of our cutlery.

Address all communications to

Cattaraugus Cutlery Co., - - Little Valley, N. Y.

STANLEY RULE & LEVEL CO.,

NEW BRITAIN, CONN., U. S. A.

Improved Carpenters' Tools.

SOLD BY ALL HARDWARE DEALERS.

Parker's

Ball-Bearing, Rapid-Grinding

COFFEE, DRUG

and

SPICE MILLS.

Large Variety of Styles
and Sizes.

Send for New Catalogue.



ALSO

The Famous Parker Gun and

VISES

and a Large Line of Hardware
Specialties.

The Charles Parker Co.,

MERIDEN, CONN.,

and 96 Chambers St., New York.

C. & F. WIRE STRAIGHTENER.



Straightens wire
from No. 3 to No.
20. It is 14 inches
long, 4½ high and
5 wide. Weight 25
pounds.

Send for Circular.

CHANDLER & FARQUHAR,

BOSTON, U. S. A.

STANDARD CHAIN COMPANY

General Offices, First National Bank Building, Pittsburgh.

MANUFACTURERS

Chain Of All Kinds.

HARDWARE CHAIN:

Proof Coll, Log, B.B. and B.B.B. Chain, Traces, Cow Ties,
Breast Chains, &c., &c.]

RAILROAD CHAIN:

Brake and Switch Chains made to specifications and test,]

AGRICULTURAL AND WAGON CHAINS:

Coll Chain cut to exact length, Stay, Lock, Pole; Anti-
Spreader Chains, &c.]

MARINE CHAIN:

Ships' Cables, Stud Link, and Marine Railway Chains,
Dredge Chains, High Grade Chain of all kinds. Cer-
tificate of test furnished.]

FOUNDRY CHAIN:

B.B. and B.B.B. Crane Chains made from special high grade
material.

PROMPT SHIPMENTS. WRITE FOR PRICES.

Our New line of Japanese Fibre and Rattan Mixed

possesses all the good points of a heavy Corn Broom
for mill, warehouse and coarse sweeping.

What
matters it
that the price of

They are much stronger, and will keep their
symmetrical shape until worn out.

CORN BROOMS

still goes **HIGHER.**

The

Brushes,
Brooms,
Foundry Supplies.

OSBORN MANUF'G CO.,

CLEVELAND, O.

Will not curl
up and get
lop-sided
like a Corn
Broom.

Write for
lists and dis-
counts.



The JEWEL
COMB
CASE

Has strong corrugated ends,
stamped front and back.

We make all descriptions of Pieced, Heavy, Polished, Stamped and
Japanned and Gray Flint Enameled Ware.

KEEN & HAGERTY MFG. CO.,

New York Salesroom, 51 Cliff Street.

Philadelphia Salesroom, 116 Market Street.

Send
for Our
Catalogue
and
Prices.



**SINK
DRAINERS**

made to fit in the
corner of a kitchen
sink, and prevent
clogging of the waste pipe. One size,
10x12x8 inches.

Main Office and Salesroom:
16 W. Baltimore St., Baltimore, Md.
Chicago Salesroom, 1115 Chamber of Commerce.

LIGHTNING
GEM
BLIZZARD

FREEZERS



ARE

Well Advertised.
In demand.
Easily sold.
Satisfactory in use.
Of known reputation.



HAVE

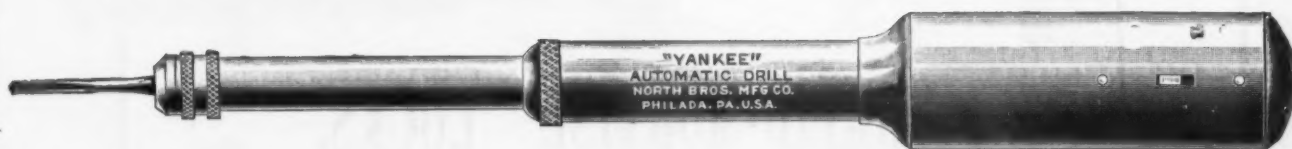
Cedar Pails with Electric Welded Wire Hoops.
Cans of Heavy Tin with Drawn Steel Bottoms.
AUTOMATIC Twin Scrapers.
"The Ice Cream Freezer Book" tells all about
these and our other Freezers. Mailed free.



EXCEL in

Easy running.
Quick freezing.
Economy.
Convenience.
Practical results.

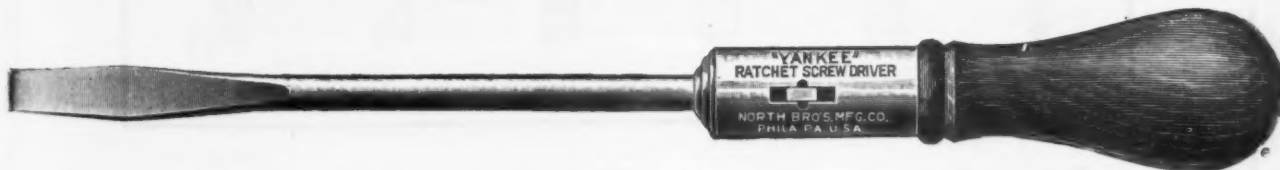
"YANKEE" TOOLS.



"Yankee" Automatic Drill.



"Yankee" Spiral-Ratchet Screw Driver.

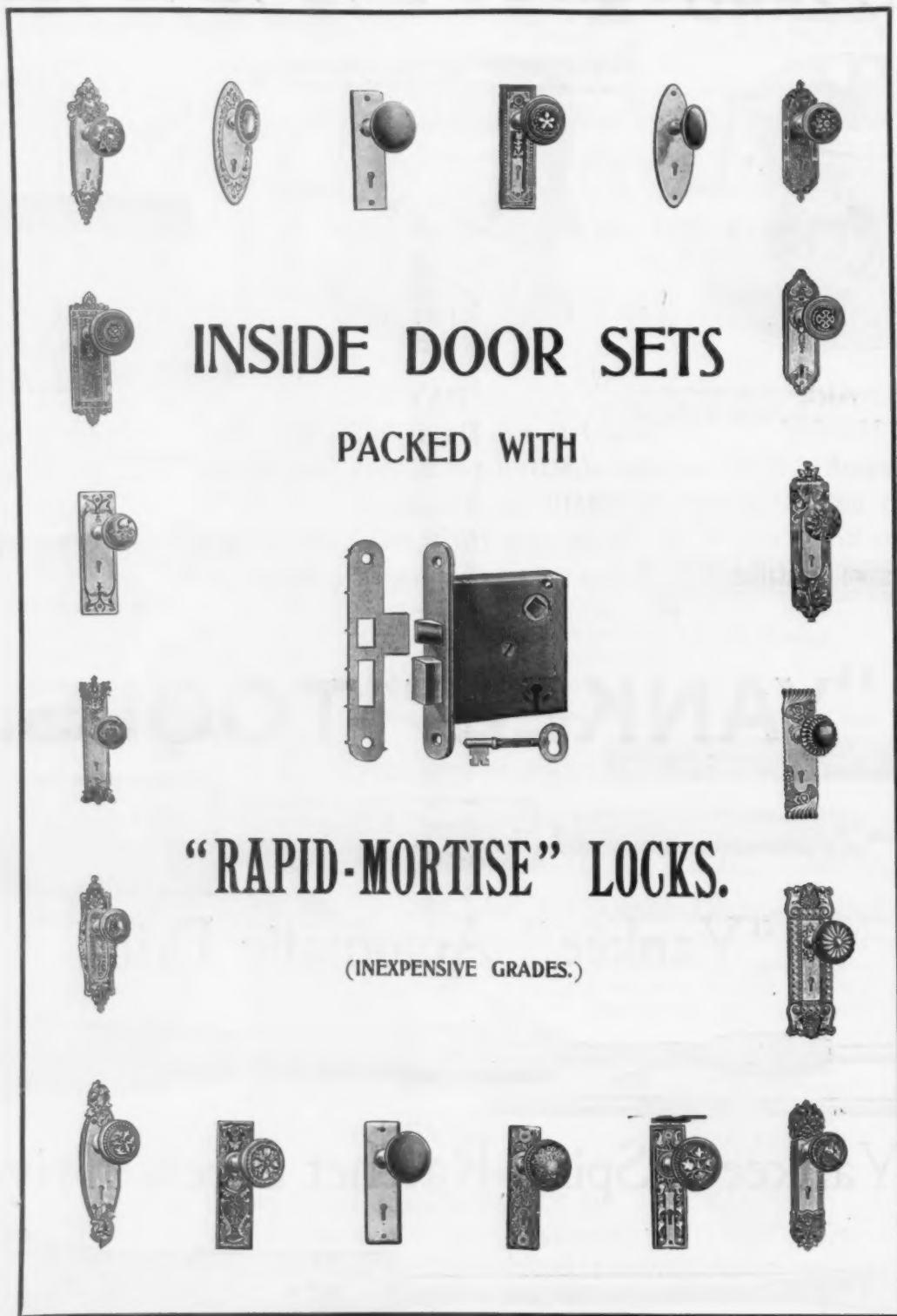


"Yankee" Ratchet Screw Driver.

Send for "THE YANKEE TOOL BOOK."

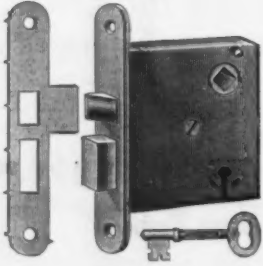
NORTH BROS. MFG. CO., = Philadelphia, Pa., U. S. A.

New York Agents: JOHN H. GRAHAM & CO., 113 Chambers St.

INSIDE DOOR SETS

PACKED WITH



"RAPID-MORTISE" LOCKS.

(INEXPENSIVE GRADES.)

RUSSELL & ERWIN MANUFACTURING CO.

NEW BRITAIN, CONN.

NEW YORK.

Philadelphia.

Chicago.

Boston.

Baltimore.

London.





AMERICAN SCREW CO.



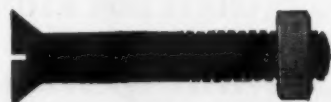
Forged Wood Screws.



Machine Screws.



Drive Screws.



Stove Bolts.



Rivets.



Dowel Screws.



Pointed Wires.



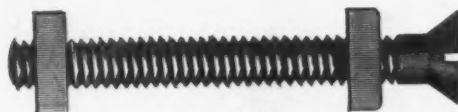
Tire Bolts.



Fluted Tire Bolts.



Sleigh Shoe Bolts.



Sink Bolts.



Wire Nails.

MANUFACTURERS OF WOOD SCREWS, MACHINE SCREWS, TIRE BOLTS, STOVE BOLTS, RIVETS AND BURRS, WIRE NAILS AND KINDRED ARTICLES IN ALL VARIETIES OF MATERIAL, FORM AND FINISH, BOTH REGULAR AND SPECIAL.



Cap Screws.



Knob Screws.



Belt Rivets.



Burrs.



Tinner's Rivets.



Hame Rivets.



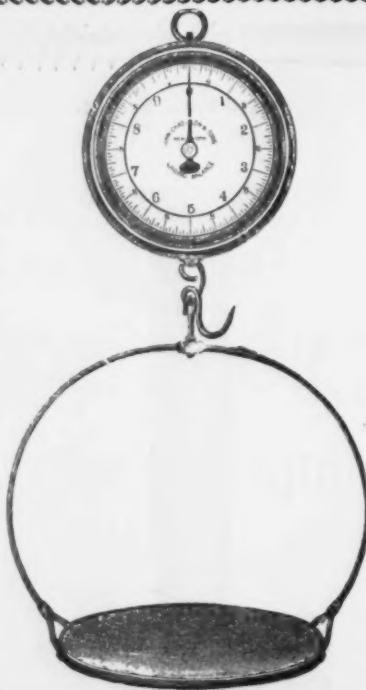
PROVIDENCE, R. I., U. S. A.



CHATILLON SPRING SCALES.

NOTICE.

OUR attention having been called to the fact that inferior makes of Spring Scales are being sold to butchers as "Chatillon" Scales, we deem it due to the trade and to ourselves, in order to protect the merits of our Spring Scales, so well and favorably known for more than sixty years, to inform you that every Spring Scale manufactured by



us has our name as makers plainly on the dial, thus:

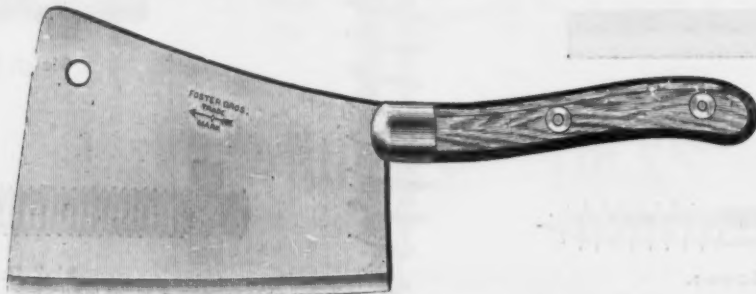
*John Chatillon & Sons
Makers.*

New York, U.S.A.

and any scale without this name on the dial is *not a genuine Chatillon Scale.*

JOHN CHATILLON & SONS,
Established 1835.

FOSTER BROS.' BUTCHER KNIVES, CLEAVERS, STEELS, &c.



These tools are recognized in the Markets, Packing Houses and Abattoirs throughout the United States as the standard of excellence, quality being the first consideration. We carry in stock every style and size of Knives, Cleavers and Steels used in cutting meat; also Knives for kitchen use in Hotels, Restaurants and for domestic purposes.

FREDERICK DICK'S MAGNET DIAMOND STEELS.



By careful workmanship and the use of a special steel in their manufacture THEY HAVE BECOME FAMOUS THROUGHOUT THE WORLD.

PHOENIX KNIFE COMPANY'S POCKET KNIVES.



Finest quality American Pocket Cutlery in large variety—Knives that are good sellers and will give satisfaction to the user.

JOHN CHATILLON & SONS,

ESTABLISHED 1835.

85 to 93 Cliff St. and 12 Jacob St.,

NEW YORK CITY.

"TRIUMPH" STEEL WIRE CHAINS
have TWICE the strength of best welded chain.

"PERFECTION" WIRE CHAINS
are like the German pattern but weldless and much stronger.

COW TIES



GIVE ME
A "BROWN" WIRE
CHAIN TIE.
THEY ARE
COMFORTABLE.

*It is a trifle early for the Retail
Dealers to order their season's supply,
Mr. Jobber, but you should order your
"BROWN" WIRE CHAIN COW TIES
now to insure prompt deliveries. We are
running nights to keep pace with orders which
have been placed for future shipment.*

Made only by
THE BRIDGEPORT CHAIN COMPANY,
Bridgeport, Connecticut,

Wiebusch & Hilger, Ltd., New York, N.Y., Agents.

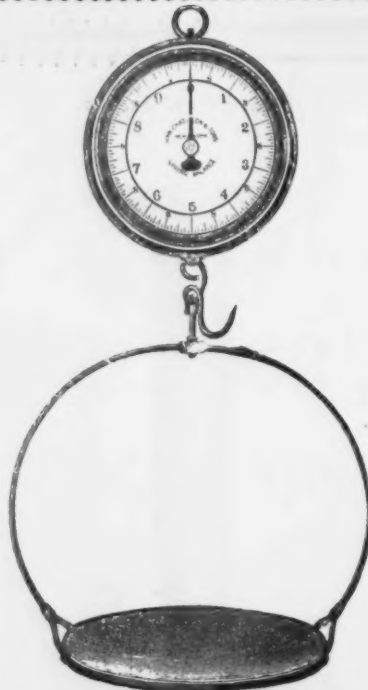
"BROWN" BESSEMER STEEL WIRE CHAINS
are made into specialties like the "TRIUMPH".
Catalogue tells all.

"MONARCH" PURE ROMAN BRONZE SASH CHAIN.
It is the STRONGEST, has a DISTINCTIVE PATTERN, RUNS EASIEST.

CHATILLON SPRING SCALES.

NOTICE.

OUR attention having been called to the fact that inferior makes of Spring Scales are being sold to butchers as "Chatillon" Scales, we deem it due to the trade and to ourselves, in order to protect the merits of our Spring Scales, so well and favorably known for more than sixty years, to inform you that every Spring Scale manufactured by



us has our name as makers plainly on the dial, thus:

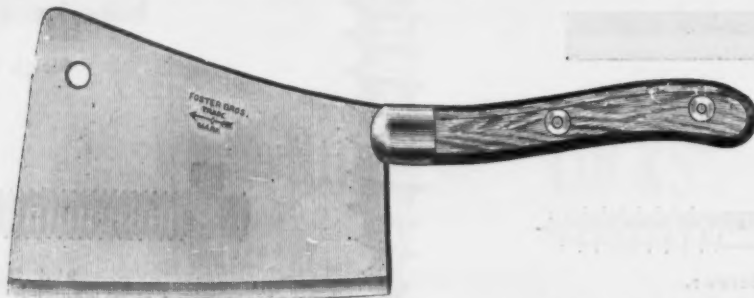
*John Chatillon & Sons.
Makers.*

New York, U.S.A.

and any scale without this name on the dial is *not a genuine Chatillon Scale.*

JOHN CHATILLON & SONS,
Established 1835.

FOSTER BROS.' BUTCHER KNIVES, CLEAVERS, STEELS, &c.



These tools are recognized in the Markets, Packing Houses and Abattoirs throughout the United States as the standard of excellence, quality being the first consideration. We carry in stock every style and size of Knives, Cleavers and Steels used in cutting meat; also Knives for kitchen use in Hotels, Restaurants and for domestic purposes.

FREDERICH DICK'S MAGNET DIAMOND STEELS.



By careful workmanship and the use of a special steel in their manufacture THEY HAVE BECOME FAMOUS THROUGHOUT THE WORLD.

PHOENIX KNIFE COMPANY'S POCKET KNIVES.



Finest quality American Pocket Cutlery in large variety—Knives that are good sellers and will give satisfaction to the user.

JOHN CHATILLON & SONS,

ESTABLISHED 1835.

85 to 93 Cliff St. and 12 Jacob St.,

NEW YORK CITY.

"TRIUMPH" STEEL WIRE CHAINS
have TWICE the strength of best welded chain.

"PERFECTION" WIRE CHAINS
are like the German pattern but weldless and much stronger.

COW TIES



GIVE ME
A "BROWN" WIRE
CHAIN TIE.
THEY ARE
COMFORTABLE.

*It is a trifle early for the Retail
Dealers to order their season's supply,
Mr. Jobber, but you should order your
"BROWN" WIRE CHAIN COW TIES
now to insure prompt deliveries. We are
running nights to keep pace with orders which
have been placed for future shipment.*

Made only by
THE BRIDGEPORT CHAIN COMPANY,
Bridgeport, Connecticut,

Wiebusch & Hilger, Ltd., New York, N.Y., Agents.

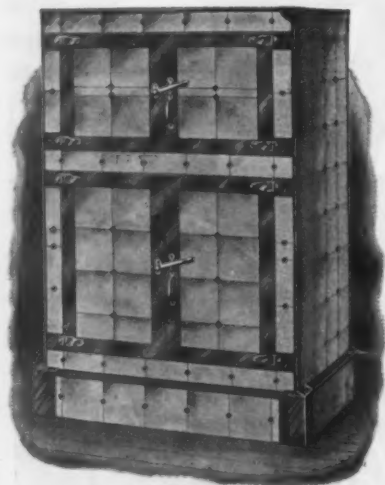
"BROWN" BESSEMER STEEL WIRE CHAINS
are made into specialties like the "TRIUMPH."
Catalogue tells all.

"MONARCH" PURE ROMAN BRONZE SASH CHAIN.
It is the STRONGEST, has a DISTINCTIVE PATTERN, RUNS EASIEST.

Did it ever occur to you?

A DEALER

Ought to Think



That a refrigerator ought not to be a temporary piece of furniture; and yet the majority of people will buy something in this line without any regard to durability.

That a refrigerator made of porcelain, outside and inside, certainly must last a lifetime. If made in this manner there can be no warping, and no foothold for disease-breeding germs.

Hence the popularity and phenomenal success of the

“WILKE.”

THE

Wilke Mfg. Co.,

RICHMOND, IND.,

ANDERSON, IND.,

U. S. A.

Send for Catalogue “C.”

ROUND TROUGH TROLLEY TRACKS and Poised Carriers are features of great value to any one hanging a rolling door.

You get these features only when you purchase the genuine Coburn Trolley Tracks and Door Hangers.

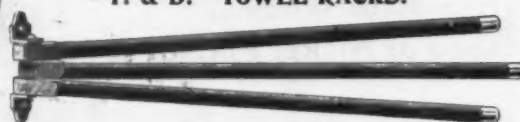
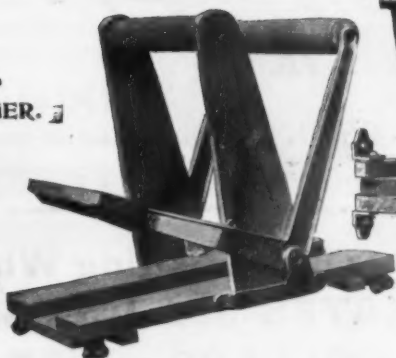
The Coburn Trolley Track Mfg. Co.,

HOLYOKE, MASS., U. S. A.

No. 1.A. OAK TOWEL ROLLERS.



"T. & D." TOWEL RACKS.

MOP
WRINGER.

19th Century Goods.

All seasonable, all up to date and all sellers, every one of 'em. We make a large variety of Hardware Specialties which it would pay any dealer to investigate. Goods shipped same day order is received. Write for catalogue and prices.

TUCKER & DORSEY MFG. CO., - Indianapolis, Ind., U. S. A.

Selling Agents, JOHN H. GRAHAM & CO., 113 Chambers St., New York.



Track Plate Socket.

We can enrich you in **CASTER**
KNOWLEDGE if you will
repeat these words:

STANDARD

BALL-BEARING CASTERS

ARE THE BEST,

for they have been proven so by Manufacturers and
Dealers who have constantly used them for six years.

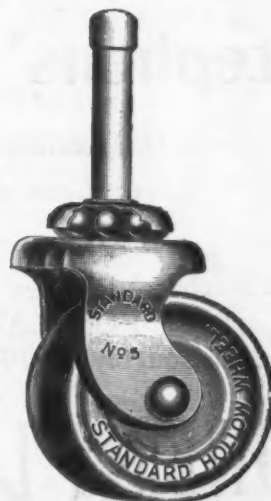
*Further knowledge for the
asking.*

Standard Caster and Wheel Co.,

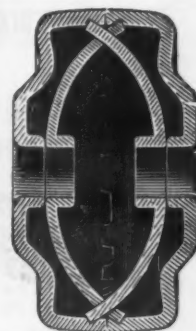
318-326 East 23d St.,
NEW YORK.



Ball-Bearing Plate Caster.

Ball Bearing Stem Caster, Fitting
Standard Track Plate Socket.

Canadian Agents: H. R. Ives & Co., Montreal, Canada. Kindly write
them for samples and prices on all Canadian business.

Showing Construction of
Our Hollow Wheel.

UNION HARDWARE CO.

TORRINGTON, CONN.

This Cut Shows Our New

EXTENSION ALL CLAMP

Roller Skate,

Plain or Roller Bearing,

Hemacite Wheels,

Polished or Nickel Plated.



—ALSO—

CYCLE SKATES.--Plain or Ball-Bearing Wheels.

ROLLER SKATES and ICE SKATES.

DOG COLLARS and LEATHER GOODS.

SHELL LOADING TOOLS and GUN IMPLEMENTS.

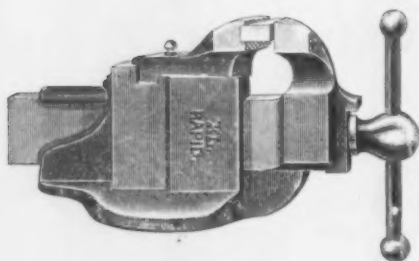
MALLETS, HANDLES and WOOD GOODS.

TACKLE BLOCKS, ETC.

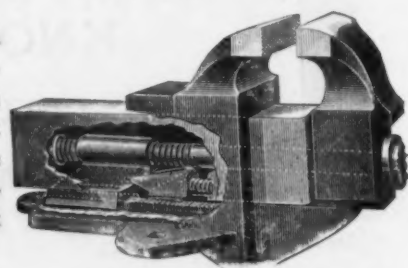
New York Office, 95 Chambers Street, in charge of TOWER & LYON.

HIGHEST QUALITY QUICK ACTING VISES,

THE SNEDIKER X. L. RAPID SCREW VISE. Simple—Durable—Heavy—Strong—Quick Acting.



The Swivel Jaw (shown in cut) a patented improvement, greatly facilitates the use of the Vise on uneven work or irregular forms. It is in fact a Self-Adjusting Taper Jaw, with the Strength of a Solid Jaw—an important feature either on Vises with Flat Base or with Swivel Base.



Combines in the largest degree **SIMPLICITY, SOLIDITY, STRENGTH.**

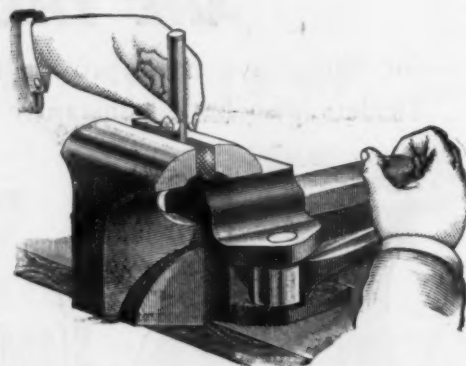
Instant Quick Adjustment by a Single Motion.

POWERFUL SURE GRIP.

Stephens' Patent Vises.

*"Old Reliable"—Quick Adjusting—
Lever Cam and Toggle Joint.*

The Stephens' Jewelers' Vises are without a rival. The most **POPULAR**, most **CONVENIENT**, most thoroughly **APPROVED**.



Firm Hold and Quick Work.

TOWER & LYON, 95 Chambers St., New York.

No. 90.



Hand made saws for mechanics, extra refined American Cast Steel selected blade. Highly polished, full skew back, full taper ground (thin back), temper perfect, and a whole lot of other good features. Write for cat.

GEO. H. BISHOP & CO., Cincinnati, O.

KEARNEY & FOOT CO., 100 and 102 Reade St., N. Y., Salaried Eastern and Export Representatives.

9



**HAND MADE
HAND SAWS**

9

For mechanics, extra refined American Cast Steel selected blade. Highly polished, full skew back, full taper ground (thin back), temper perfect, and a whole lot of other good features. Write for cat.

GEO. H. BISHOP & CO., Cincinnati, O.

KEARNEY & FOOT CO., 100 and 102 Reade St., N. Y., Salaried Eastern and Export Representatives.



A Combined
Easel,
Book Rest
Music Stand,
Drawing
Stand,



TRADE
MARK.



ALL IN ONE
PIECE OF
FURNITURE.



Reading
Stand,
Sewing
Stand,
Invalid Stand,
Card Stand.

STANDORETTE

For further information send for Catalogue E, mailed free.

D. H. ALLEN & CO., MIAMISBURG, OHIO.



UDELL



A. A. BARNES, Prop'r.

STEP LADDERS, CLOTHES BARS, HOOK RACKS, FOLDING CLOTHES RACKS, TOWEL ROLLS, TOWEL ARMS, ROPE REELS, IRONING STANDS AND BOARDS, FOLDING TABLES, COMMODOES, MEDICINE CABINETS.

W. A. STOKES & CO., and M. R. UDELL & CO.,
30 Warren Street, New York, 501 No. Main St., St. Louis, Mo.



INDIANAPOLIS, IND., U. S. A.



The Handiest.

You Can Get Higher than
with any Other.

You get two ladders for the same money which you pay for one of the old unsafe kind.



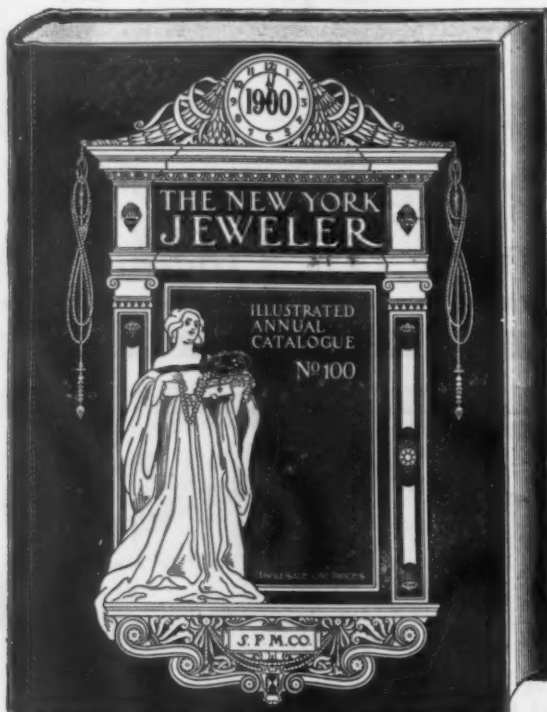
The "Handiest"
Step Ladder

Can be extended to double its length; the malleable casings keep the wood from splitting; no strain on the screws; platform shelf works automatically; upper tread has iron pins going through to prevent breaking, and flanges keep the ladder from going out of joint.

THE HANDY LADDER WORKS,
CLEVELAND, OHIO, U. S. A.



ARE YOU LOOKING FOR *Profitable Side Lines?*



724 Pages, Size 9 x 13.

If so, THIS is what you want.

OUR GREAT

CATALOGUE

Uniform List Prices.

For twenty-six years the acknowledged authority for choice new designs and lowest prices current in the New York market. Free to dealers in any of the following lines:

**WATCHES, DIAMONDS,
JEWELRY,
OPTICAL GOODS,
Silver Novelties, Silverware,
Musical Mdse., Clocks, Lamps, Cut Glass,
Fine Leather Goods, Fine Stationery,
Cameras and Photographic Supplies,
Badges and Emblems, Jewelers'
Sundries, Fine Mechanical
Tools and Mathematical
Instruments, Etc.**

S. F. MYERS CO., Manufacturers, Importers
and Wholesale Jewelers,

Myers Building, 48, 50 Maiden Lane, 33, 35 Liberty St., NEW YORK.

Address Department No. S 14 when sending for catalogue.

THE "SIMPLICITY"
INCANDESCENT
GASOLINE
VAPOR LAMPS.



Beautiful, safe light.
Five hours' service of 100
candle power light costs
one cent. Free catalog
of various designs.

H. MERKEL,
517 Elm St., St. Louis, Mo.

**Trojan One Hand Nail Pullers,
Little Trojan Tack Pullers.
SQUEEZE DRY
LEMON SQUEEZERS
ARE THE BEST.**

We want Specialties to make
Iron, Steel or Brass.

Large Shop with
Brass Foundry Connected.

HAGEN & REID,
Troy, N. Y.

THE IMPERIAL GAS LAMP,

FULLY COVERED BY U. S. PATENTS.

The Imperial Gas Lamp has won its place on its *merits*. It has long passed the experimental stage and is now firmly established as *The Most Satisfactory, The Most Economical, and The Most Beautiful.*

The Imperial burns common stove gasoline and gives a 100 candle power light without odor or smoke. There is no clogging and no flicker. No torch is used. The light will not blow out. It is not affected by draught or wind.

Every lamp is guaranteed to do all claimed for it, and each lamp is tested by actual burning before it is shipped.

Send for *Illustrated Catalogue*, and you will readily see why The Imperial must be the most satisfactory light. It is simple in construction and easy to operate.

THE IMPERIAL GAS LAMP CO.,
132 and 134 Lake St., Chicago, Ill.

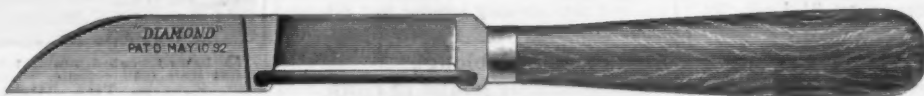
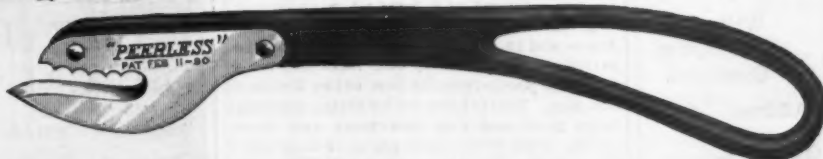
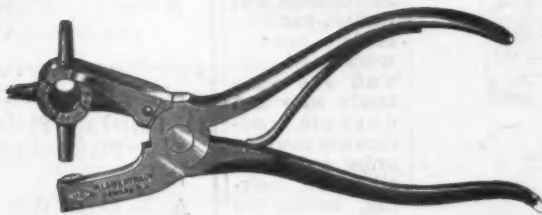


No. 101.

KNIVES.

L. D. PARKHURST, Danielson Conn., U. S. A.
Manufacturer of superior specialties in Butcher, Bread, Cake
and Kitchen Knives; also over 100 other styles in Shoe, Rubber,
Oyster, Putty Knives, etc.
SEND FOR CATALOGUE AND PRICES.

Hardware Specialties



For information
and prices
write to

JOHN H. GRAHAM & CO.,

Sole
Selling
Agents,

113 Chambers Street,
P. O. Box 1042, New York, N. Y.



MONITOR CASH REGISTER, NO. 1.

...A NEW SYSTEM...

A CASH REGISTER selected from the various styles, either of the MONITOR or GUARDIAN type, will do the work of nine stores, restaurants, or barber shops, etc., out of every ten, better than any other costing five times as much as these or even more.

The Register separates the sales in any amounts from .01 to \$99.99 of any reasonable number of salesmen, as well as sales from departments, also amounts "Paid Out," "Paid on Account," or "Charge Sales."

Beating them is out of the question.

They are highly ornamental, beautifully finished, and thoroughly made.

Nine different styles.

Prices from \$10.00 to \$40.00.

Descriptive circulars and locations of agencies on application to

WHITING MFG. CO., MAKERS,

Northborough, Mass., U. S. A.



MAKE YOUR OWN GAS AT 15 CTS. A MONTH.

BRIGHTER THAN ELECTRICITY, SAFER AND BETTER THAN GAS OR KEROSENE,

The Brilliant Safety Gas Lamp.

It is the one lamp that has never failed to give satisfaction or do as represented; that's why the "Brilliant" stands at the head of all other gasoline lamps. **Over 20,000 now in use.**

One filling will last 18 hours and requires no attention.

Anyone can run them; can be hung anywhere or carried about. Approved by the insurance companies.

Brilliant Gas Lamp Co.,

42 State Street, Chicago, U. S. A.

GEORGE BOHNER, Agent.

Opposite Masonic Temple.

THE DROUVE VENTILATOR



The best and cheapest Ventilator on the market. Made in all sizes. Send for catalogue and prices.

**THE G. DROUVE
COMPANY,**
Bridgeport, Conn.

Skylight and
Sheet Metal Work.

The MILBRADT ROLLING STEP LADDERS



have the highest recommendation from thousands of customers. They are the handsomest and easiest-running ladders made; work noiselessly, and are absolutely safe and durable. Ladders are made to order and to fit all kinds of shelving, in various styles, to suit all purposes.

Write for
Descriptive
Catalogue.

Address

G. A. Milbradt & Co.,
1922 and 1924 N. Broadway, St. Louis, Mo.
Or **JOHN CALANDER,**
148 E. 8th St., St. Paul, Minn.

J. A. WESTON'S STORE LADDER SERVICE.



Special Features,
Smaller Space,
Bear More Weight,
Last More Years than
all others.

The trolley guide wheels at the top allow the ladder to be used at any desired angle. These ladders run on noiseless ball bearing rubber covered rolls that do not require any track on the floor. Made of White Ash, finished light.

Portland Ladder Co.,
Manufacturers of all kinds of
Ladders.
26 Pine St., Newark, N. J.

HARDWARE SHELF BOXES.

Look the matter up. Descriptive circular with list of references and prices mailed on request. We also make a general line of Paper Boxes.
THE JESSE JONES PAPER BOX CO.,
615 and 617 Commerce St., Philadelphia.

LIVE HARDWARE MEN USE PERFECT SHELF BOXES WE MAKE PERFECT SHELF BOXES

WRITE FOR
CATALOGUE AND PRICES.
C. P. MOORE,
RAVENSWOOD, W. VA.

SAFETY FUSE.

ENSIGN, BICKFORD & CO.,
Simsbury, Connecticut,
U. S. A.

Modern American Dwellings

WITH CONSTRUCTIVE DETAILS.

This is the largest and most complete volume of Perspective Views, Floor Plans, Elevations and Constructive Details of modern homes now published.

IT CONTAINS

37 Selected Designs of Beautiful Modern Residences,

ILLUSTRATED BY

Full-Page Half-Tone Engravings of the completed Buildings.

127 Full-Page Plates of Elevations, Floor Plans and Constructive Details.

ALL DRAWN TO SCALE.

40 Pages of Descriptive Text.

BRIEFLY DESCRIBED this great work is arranged as follows: A page of text is given before each design, describing the house and including particulars relative to materials, finish, cost, etc. Next follows a full-page photo-reproduction of the finished building. This is followed by plates showing large front and side elevations and floor plans. Then follow page plates of Constructive Details. The book contains in all several hundred cuts showing interior and exterior trim.

Size 9 x 13 in. (oblong),
Handsomely bound in cloth.
PRICE \$2.00, prepaid.

DAVID WILLIAMS CO., PUBLISHERS,
232-238 WILLIAM ST., NEW YORK.

THE BICYCLE STEP LADDER.

Especially adapted for Hardware Stores.



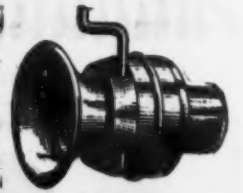
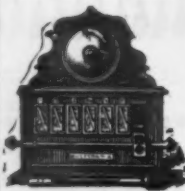
The newest, neatest, simplest, easiest operated and safest store ladder made. Highest Award World's Fair. Write us. **THE BICYCLE STEP LADDER CO.,** 45 Randolph St., Chicago, Ill. Eastern Agent, H. N. YOUNG, 9 Clinton Place, New York City. New York City and vicinity, E. J. HUSSEY & CO., 80 John St., New York City. California, JOHN WOODLOCK, 154-156 First St., San Francisco, Cal. North Western States, HOWE SCALE CO., Portland, Ore. Texas and S. W., ED. FOY, Dallas, Tex.

W. R. OSTRANDER & CO.,

25 DRY STREET, NEW YORK.

Manufacturers of
SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC
MECHANICAL AND PNEUMATIC ANNUNCIATORS
AND BELLS.

Complete outfits of Speaking Tubes, Whistles, Electric, Mechanical, and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, N. Y.



Boss Harness Riveter

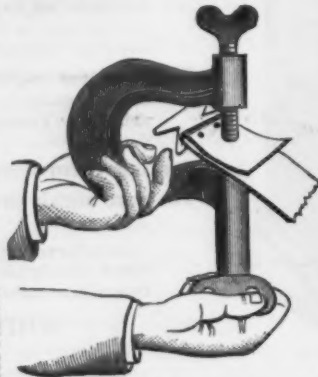
The cheapest and best Riveter in the market, and the only one that will repair heavy harness tugs and rivet on loops. It is a whole Harness shop in one tool.

We are extensive manufacturers and are prepared to fill all orders promptly for any and all kinds of Grey Iron Castings, Japanned and Finished. Estimates solicited for Machinery and Small Engines.

**ORANGEVILLE AGRICULTURAL WORKS AND
FOUNDRY,**

J. W. CONNER Prop.

Orangeville, Pa.



Cast Brass Butt Hinges

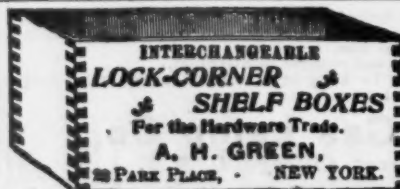
IN STOCK AND FOR SALE BY

W. & J. TIEBOUT,

No. 118 Chambers St., New York,

MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.



WE MAKE . . .

STEEL HARDWARE SHELF BOXES

ANY SIZES TO FIT YOUR
SHELVING.

SEND FOR CATALOGUE.

HELLER BOX CO., Montclair, N. J., U. S. A.

WIEBUSCH & HILGER, Ltd.,

9-15 Murray Street, New York.

San Francisco Office, 165 Front Street, HUGHSON & MERTON.

MANUFACTURERS' AGENTS AND IMPORTERS.**SOLE AGENTS FOR**Essex Horse Nail Co.,
Horse Shoe Nails.Clark & Parsons Co.,
"Lightning" and "Maine" Hay Knives.Challenge Cutlery Corporation,
Successors to Hatch Mfg. Co.,
Razors and Farriers' Knives, Pocket
Cutlery, Etc.

"Seymour" Shears and Scissors.

Pope's Farriers' Knives.

Taintor Mfg. Co.,
Taintor Positive Saw Sets.Press Button Knife Co.,
Press Button Knives.Hilger & Sons,
German Hardware and Cutlery.Isaac Nash,
Genuine T. Waldron Scythes.

American Shearer Mfg. Co.,

Priest's Hand and Power Horse and
Toilet Clippers.Ferre Carbon Castings Co.,
"Rex" Hammers and Hatchets.Eyeless Tool Co.,
Eyeless Picks and Tools.Higginum Hardware Co.,
"Acme" Nippers.New York Stencil Works,
Steel Letters and Figures.Needham Bros., Ltd.,
"Repeat" Cutlery and Sheffield Goods.Burgon & Wilkinson, Ltd.,
Sheep and Garden Shears.**NEW YORK MANUFACTURERS' HEADQUARTERS FOR**Bridgeport Chain Co.,
Peter Wright's Anvils,Chesterman's Tapes,
Hoffman's Steels,Roses' Trowels,
Brades' Trowels,

Wade & Butcher Razors and Tools.

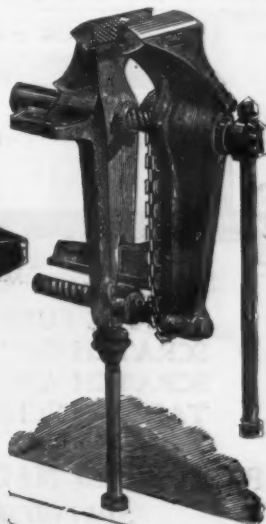
Warranted Better than the Best

ENGLISH ANVILFace in one piece of BEST TOOL CAST
STEEL, PERFECTLY WELDED, per-
fectly true, of hardest temper, and never
to come off or "settle." Horn of tough
untempered steel, never to break or bend.
Only Anvil made in the United States
fully warranted as above.**FISHER DOUBLE-SCREW VISE**IS FULLY WARRANTED STRONGER
THAN ANY OTHER LEG VISE, AND
ALWAYS PARALLEL. Is the best Vise
for Machine Shops and Blacksmiths, and
for all heavy work. ACCURATE AND
DURABLE. Send for Circular.

ESTABLISHED 1843.

MORE THAN 200 DIFFERENT PATTERNS.

None Genuine without our Trade-Mark.

EAGLE and "FISHER" Stamp.**EAGLE ANVIL WORKS, Trenton, N. J.**Sold in New York by our Agents, J. C. McCarty & Co., 10 Warren St., The Russell & Erwin Mfg. Co.,
43 Chambers St.Improved Adjustable S-Wrench.
Case-Hardened Throughout. Parts Interchangeable.For Circulars and Price-List, address
BEMIS & CALL HARDWARE & TOOL CO.,
SPRINGFIELD, MASS., U. S. A.

Aspinwall DOUBLE ACTION
BARREL CHURN

Striking development in Rapid
Butter Making. Revolves and
Oscillates, and having no
dash or other internal ma-
chinery it does not break
up the fat globules, but
preserves the grain of
the butter. No other
churn on the market
equal to it. Beautiful
circular mailed free. Re-
liable agents wanted.

**ASPINWALL
MFG. CO.,**
Jackson, Mich.



ASK FOR Scythestones and Oilstones.

It will pay you to handle them.

A FEW OF THE LEADING BRANDS:



Black Diamond, Fast Cutters, Sharp, Fine Grit.



White Mountain, Medium Coarse Grit.



Indian Pond, Red End, Coarse Grit.

Pike's Scythestones cannot be equalled in Sharpening Qualities, Strength and Finish.

THE PIKE MANUFACTURING CO.,

LILY WHITE WASHITA.

A First-Class Oilstone.

This is the BEST selection of Washita possible to obtain.

The Best Oilstone for Carpenters.



New York Office, 151 Chambers St.

Pike Station, N. H., U. S. A.

HACK SAW FRAMES.



CLAMPS,
CENTRE PUNCHES,
SCRATCH GAUGES,
SCRATCH AWLS,
TAP WRENCHES, ETC.

SPRINGFIELD MACHINE & SCREW CO.,
SPRINGFIELD, MASS.

Send for circulars of our line of

MACHINISTS' SMALL TOOLS.

SPRING BELT PUNCHES.



CHICAGO: 36 La Salle St.

MODERN METHODS

of Store Arrangement, Accommodation and Effective Display of Hardware Stock are illustrated and described only in

The American Hardware Store.

450 Pages. 500 Illustrations.
THREE DOLLARS.

DAVID WILLIAMS CO., Publishers.
932-938 William St., New York.



The Old
Reliable
Kind.

New York Office,
107 Chambers St

SEND for our catalogue of improved quick-acting, time-saving bench vises, planer and milling vises.

MASSEY VISE CO.,
CHICAGO, ILLS.

Metal Worker's Crayon.

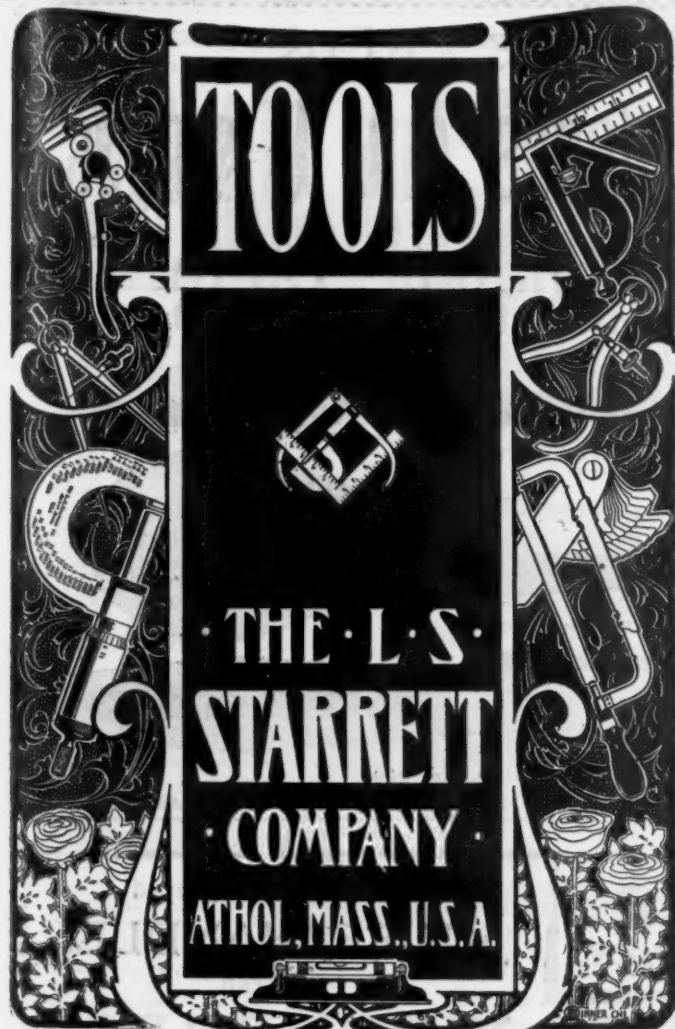
THE D. M. STEWARD MFG. CO.

Genuine Soapstone Pencils.

D. M. STEWARD MFG. CO.

Uniform
Discounts

CHATTANOOGA,
TENN.



TOOLS



THE L. S. STARRETT COMPANY
ATHOL, MASS., U.S.A.

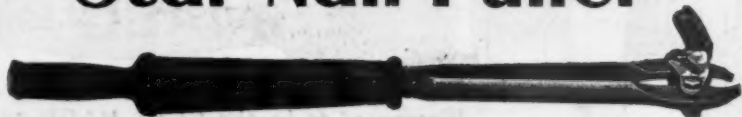
NEW CATALOGUE

NO. 16 A

NEW TOOLS—Combination Squares with hardened blades; new style Combination Square, No. 17; Carpenters' Square; Center Square; Pocket Slide Caliper; Micrometer Gauge No. 24, 12 to 36 in.; Micrometers with finger ring; Micrometers with ratchet stop; Attachment for converting a 2 in. into a 1 in. Micrometer; Micrometer No. 127, 0 to 12 in.; Inside Micrometer, 32 to 107 in.; Thickness Gauge, No. 172; Inspectors' Gauges; Little Giant Jack Screws; Complete line of Hack Saws; Universal Surface Gauge, No. 57; Screw-adjusting Calipers; Double Calipers; Carpenters' Dividers, No. 92; Stair Gauge Fixtures, No. 111; Trammels, No. 59; Drill and Tap Gauges.

ASK FOR
CATALOGUE NO. 16 A
IT IS FREE

★ Star Nail-Puller ★



**BEST.
SIMPLE.**

Self Opening, No Spring Being
Used
Truss Construction. Easy in
Operation.

**STRONGEST.
EFFECTIVE.**

THE ATWATER MANUFACTURING CO.,
SOUTHINGTON, CONN., U. S. A.

DROP FORGINGS

THE BELDEN MACHINE CO.,

Whalley Ave. and Tryon St.,
NEW HAVEN, CONN.

Drop Forging in all its branches. Special attention given to Automobile, Locomobile and all Electrical work. Estimates given from blue prints or models. Correspondence solicited.



ANVILS.

SOLID WROUGHT.
WARRANTED.

HERMAN BOKER & CO.,
101 Duane St., New York,
General Sales Agents.

Manufactured by

COLUMBUS FORGE & IRON CO., Columbus, Ohio.



THE VELOX

ball bearing grindstone runs as easy as a bicycle. All parts are made from steel, and will last a lifetime. The stones are the best obtainable. When folded and crated they occupy but little space. With the Velox one man does the work of two. If your jobber does not handle them, write to us.

VELOX MACHINE WORKS,
307-321 Dearborn Street, CHICAGO.



THE Taintor Positive Saw
Set 20 has every good point possessed by any other saw set, besides a number peculiar to itself.
TAINTOR MFG. CO.

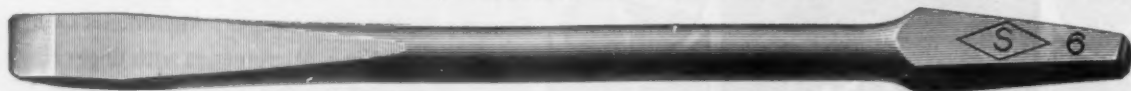
Wiebuech & Hilger, Ltd., Agents,
9 to 15 Murray St., NEW YORK.

UTICA DROP FORGE & TOOL CO., N. Y. Office, 296 Broadway, N. Y. City. Factory, Utica, N. Y., U. S. A.
FINE AMERICAN TOOLS. SEND FOR FREE CATALOGUE.

FINE AMERICAN TOOLS. SEND FOR FREE CATALOGUE



H. H. MAYHEW CO., Shelburne Falls, Mass., U. S. A.

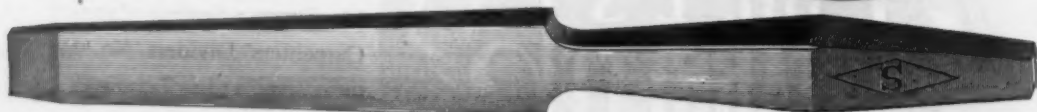


MAYHEW'S CABINET SCREW DRIVER BITS, No. 360.



BLACK HANDLE SCREW DRIVERS, No. 100.

**Send
for
Catalogue.**



MAYHEW'S FLAT SCREW DRIVER BITS, No. 350.

LARGE LINE OF HARDWARE AND MECHANICS' TOOLS.

PATENTED ARTICLES OF
MALLEABLE IRON.

NEW pattern Heavy Screw Clamps.
Strongest in the market.



Hammer's Malleable Iron Oilers, 3 Sizes.
Hammer's Malleable Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.
Hammer's Adjustable Clamps.

For sale by all the principal Hardware Dealers.
Send for Price-List.

MALLEABLE IRON CASTINGS
of superior quality, and Hardware Specialties in
Malleable Iron made to order.

HAMMER & CO.,
BRANFORD, CONN.

VAN DORN'S Steel Joist Hanger

HAS NO EQUAL

Send for Catalogue.

**THE VAN DORN
IRON WORKS CO.,
Cleveland,
Ohio.**

**STRUCTURAL STEEL
AND ORNAMENTAL IRON WORKERS.**

**COES
WRENCHES.**

The Genuine Improved
KNIFE HANDLE
PATENTED.

SCREW WRENCHES.



Warranted to be the BEST MADE and STRONGEST WRENCH in the MARKET.

COES WRENCH CO.,
Worcester, Mass.

New York Agents:
J. C. McCARTY & CO.,
JOHN H. GRAHAM & CO.

Has a straight bar and extra long nut for screw in jaw.

**Send for Circular
and Prices.**



HEAVY and LIGHT FORGINGS.

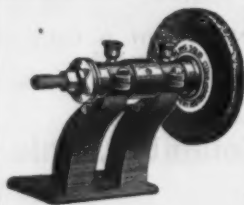
Hydraulic Pressed.
Drop Forged.
Hammer Forged.

WYMAN & GORDON,

WORCESTER, MASS.



Weight, 8 pds., steelforging.



Lawn Mower Grinding is a trick hard to learn, but so easy a child can do it with the proper equipment. We have the tool,

ZACHARIAS & CO.,

725 Mattison Ave., Asbury Park, N. J.

.....

STANDARD
FACTORY
BRANDS
of the
NICHOLSON
FILE CO.,
and
WARRANTED BY
THEM.
.....

**EAGLE
AMERICAN
NICHOLSON
McCLELLAN
GREAT WESTERN**

.....

LARGEST
MAKERS of
FILES and
RASPS
in the
WORLD.
.....

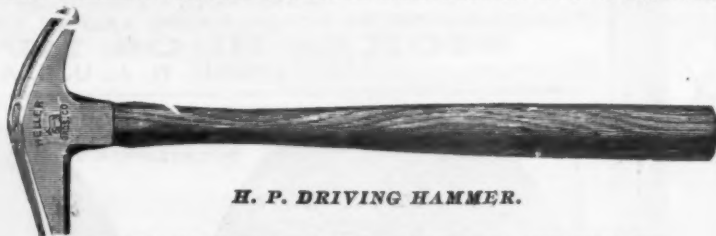
"BEST BY TEST."

"HELLER'S"

THE WORLD'S STANDARD.

Horse Rasps, Files and Farriers' Tools

Have been steadily IMPROVED in manufacture, kept constantly up to date and abreast with the TIMES. Their SUPERIOR QUALITY sets a known and tested STANDARD of EXCELLENCE. Made from OUR OWN PRODUCTION of SPECIAL REFINED CLAY CRUCIBLE CAST STEEL and manufactured under machines of OUR OWN PATENTED CONSTRUCTION as well as TEMPERED by a SECRET PROCESS.



H. P. DRIVING HAMMER.

NEW 1900 CATALOGUE MAILED FREE ON APPLICATION.

HELLER BROTHERS CO., { Established 1836 } Newark, N. J., U. S. A. { Incorporated 1899 }

"HAY-BUDDEN" Solid Wrought Anvils.FIRST MADE IN
AMERICA....

Fully Warranted.

America for Americans.

Why use a foreign Anvil when you can get one of American manufacture, which is Superior in Quality, Form and Finish to any imported? For sale by all dealers.

Received Gold Medal, Highest Award for Anvils at Omaha, 1898.

HAY-BUDDEN M'F'G CO.,284 NORTH HENRY ST.,
BROOKLYN, N. Y.**Die and Steel Forgings.
Weldless Rings.****Forged Tool Steel
Spinning Chucks**

Superior to steel castings.

Our steel is made expressly and solely for us. Dies forged under our system will cut 10 to 20 % more blanks than others before regrinding.

ATHOL MACHINE CO.,
Athol, Mass., U. S. A.
Manufacturers of
**Vises, Meat Choppers,
Mechanics' Fine Tools, &c.**
Send for Catalogue.

FOUNDRY LAMP.

MADE OF
CAST IRON, FOR
Shops, Steam-
boats and
Factories of all
kinds.

MADE BY
THE
Forest City
Foundry & Mfg. Co.
Cleveland, O.
Makers of Fine Light Gray Iron Castings.

The World's Greatest File Works.

ESTABLISHED 1842.



THE ARCADE FILE WORKS at Anderson, Indiana, is the largest and most completely equipped plant for the manufacture of Files in the world.

The highest inventive genius and mechanical talent has been concentrated on **ONE** Modern Plant, which is directed by master minds—originators of a distinctly improved product—machinery and methods up-to-date.

Back of an Arcade File stands this guarantee: That our Arcade File will cut faster and wear longer than any other file on the market, and as an "earnest" of this guarantee, The Arcade File Works will send to any responsible Hardware Jobber, Wholesaler or Retailer, one dozen Arcade Files, to become the property of the receiver or returned at our expense if the guarantee is not fully borne out in every particular.

NEW YORK CITY, 97 Chambers St., 79 Reade St. WORKS, ANDERSON, IND. CHICAGO, 118 Lake Street.

Severance
Centering Tool,

PRICE \$2.00

Combination
Center Drills,

PRICE \$1.50 PER DOZ.

With these two tools you can center your work in two operations. It requires at least four in the old way.

Our Catalog for the asking.

J. T. Slocomb & Co.,

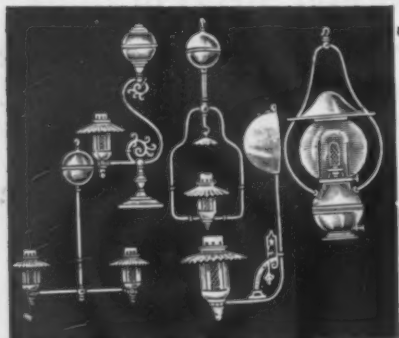
Prov.,

R. I.

Chas. Churchill & Co., London, Eng.



YOU WANT ME



I am the most brilliant Gasoline Lamp in the world. I make my own gas, never get out of order. Ask your jobber about me. If he don't keep me, write

METROPOLITAN DAYLIGHT LAMP CO.,
132 Lake Street, CHICAGO.

**WOODMAN'S
SPEED
INDICATORS.**



For ascertaining correct speed of Dynamos, Steam Engines, Shafting, Floor Machines, etc. Supplied with Rubber Tips, Split Caps and Plain Caps, etc. Send for catalogue and prices.

R. WOODMAN MFG. & SUPPLY CO.,
Boston, Mass., U. S. A.

Sole manufacturers of the celebrated
STOKES BROTHERS HORSE RASPS AND ST. CRISPIN SHOE RASPS
STOKES BROS. MFG. CO.,
FREEHOLD, N. J., U. S. A.

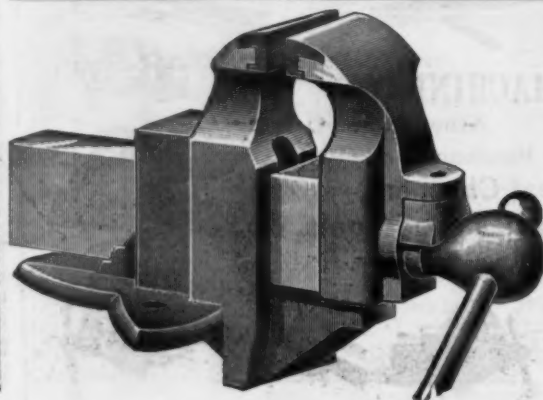


THE ELGIN WRENCH.



The best general purpose wrench on the market. It will turn a nut, hold a pipe or twist a rod. It is not clumsy, but flat and neat. It is the only adjustable wrench (with its range of work) that can be conveniently carried in the pocket. When jaws wear out, old ones can be replaced with new. Nickel plated and perfectly constructed. Write us for prices.

STAR MANUFACTURING CO.,
CARPENTERSVILLE, ILLS



VICES.

SEND FOR
CATALOGUE.

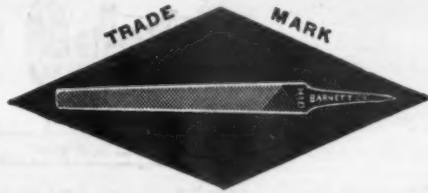
HOWARD IRON WORKS,
BUFFALO, N. Y.

Also Manufacturers of Passenger
and Freight Elevators, Electric, Hy-
draulic and Hand Power.

BLACK DIAMOND FILE WORKS,

Established 1863. Incorporated 1895.

Twelve Medals of
Award at
INTERNATIONAL
Expositions.



Special Grand Prize
GOLD MEDAL,
Atlanta, 1895.

G. & H. BARNETT COMPANY,
PHILADELPHIA, PA.

J. M. KING & CO.,
WATERFORD, N. Y.

Manufacturers of

BUTTON'S

**Pat. Wire Cutter
AND PLIER COMBINED**

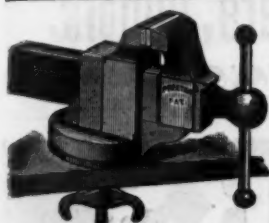


Specially Adapted for Use on Wire Fence.

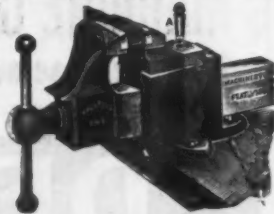
Also manufacturers of BLACKSMITHS' and
MACHINISTS' STOCKS and DIES, PLUG and
TAPER TAPS, HAND, NUT and SCREW TAPS,
PIPE TAPS and REAMERS.

Price-List on Application.

Established by DANIEL B. KING, 1899.



*We make all
kinds and sizes
of Vises.*

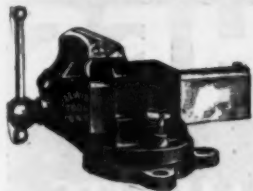


Descriptive Catalogue Free.

PRENTISS VISE CO., - 44 Barclay Street, New York.

Sole Agents for Great Britain: CHAS. NEAT & CO., 112 Queen Victoria St., London, E. C.

LEWIS PATENT QUICK-ACTING VISE



**DURABLE, POWERFUL
and TENACIOUS
as any Screw Vise.**



Commence to draw as soon as
lever is started and have suffi-
cient gether for any kind of
work.

Send for Illustrated Catalogue.

Lewis Tool Co., 44 Barclay St., New York.



Decided improvement. Less friction. Can be
changed from a roller to a three-wheel cutter.
Extra wheels in the handle. Send for catalog.
TRIMONT MFG. CO., Roxbury, Mass., U.S.A.

L.A. EUCKER STAMP WORKS

LITTLE FERRY, Bergen Co., N. J.



Die Sinks, Steel
and Brass Stamps,
Seals, Stencil Dies
for Stencil Cutting,
Die Letters, Stamping, Letters, Brands,
Badges and Medals, Key Checks, Door and Name
Plates, Experimental Work, etc.



GEO. M. NESS, Jr.

ENGRAVER AND DIE SINKER,
61 FULTON ST., N. Y.

STEEL STAMPS,

Steel Letters and Figures,
Burning Brands, Stencils, &c.
MACHINE ROUTING FOR
THE TRADE.



SEWING MACHINES ARE A PROFITABLE SPECIALTY FOR THE HARDWARE TRADE...

With those who have pushed them well they have become really a Staple with special profit; and the trade is awaking to the fact that

**THEY
CONSTITUTE
A
PARTICULARLY
DESIRABLE
LINE
TO
HANDLE.**



FITTED WITH BALL BEARINGS.

We manufacture high quality goods in largest quantities. Have been at it for twenty years.

We supply more of the trade than all other makers combined.

The Hardware Trade is our specialty.

Correspondence Solicited.

NATIONAL SEWING MACHINE CO., FACTORY and HOME OFFICE, **Belvidere, Illinois.**

SEAVEY'S - - - SEAMLESS Ice Cream Dish.

THE BEST MADE.



Made of Heavy Steel, Pure Tin Plated, with German Silver Knives. Correct Measure. No. 1 to a quart, 16, 12, 10, 8, 6, 5, 4. Send for 1900 Revised Price List and Special Discount

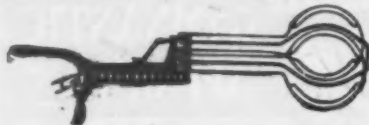


Folding Lunch Box

Japanned and Grnamented. Made in Two Sizes. Send for Trade Discount.

SEAVEY MFG. CO., Boston, Mass
Manufacturers of Plain, Stamped and Japanned Tinware.

EGG BEATERS. We make the largest line in the world. Send for samples and prices. **STANDARD CO.** 107 Haverhill St., Boston, U. S. A.



SEND FOR
1900
CATALOGUE

REFRIGERATORS.

"WHITE MOUNTAIN" Refrigerators are a distinctive type by themselves. They are built upon honor and built to last.

Maine Manufacturing Co.,
NASHUA, N. H.

DEALERS
Wanted in every town to handle the best selling and most complete line of

VARNISHES

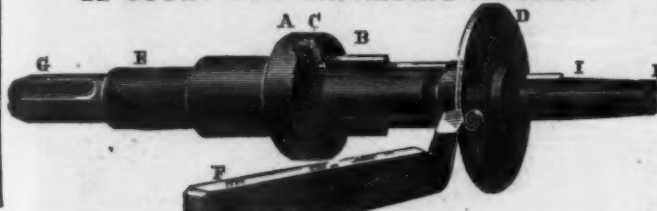
IN THE MARKET
SPECIAL INDUCEMENTS

FOR PARTICULARS APPLY TO
STANDARD VARNISH WORKS

THE LARGEST VARNISH WORKS IN THE WORLD.
Factories covering 7 Acres, ELM PARK, STATEN ISLAND, N. Y.

GENERAL OFFICES.
CHICAGO. 2620 ARMOUR AVE. 29 BROADWAY. LONDON. 23 BILLITER ST.
NEW YORK.

LE COUNT NEW EXPANDING MANDREL.



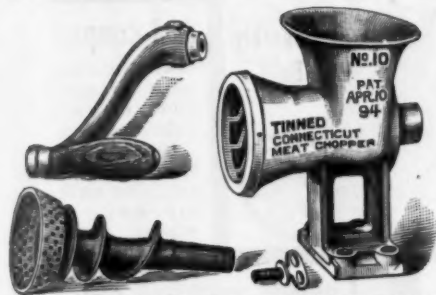
Send for
Catalogue to

**W. G.
LECOUNT**

80. NORWALK,
CONN.

CONNECTICUT MEAT CHOPPERS

THE NEW CONNECTICUT CHOPS and PULVERIZES.



ONLY
TWO
PARTS
TO
CLEAN

In three sizes, 8, 10, 12. For Butchers, Marketmen, Farmers, Poultry Breeders, Hotels, Restaurants and Public Institutions. For smaller sizes order "THE NEW CONNECTICUT," No. 20, 40, 60.

New York Office,
W. H. JACOBUS,
No. 90 Chambers St.

C. M. AVERY & CO.,
Direct Representatives,
165 Lake St., Chicago, Ill.

Housekeepers can now
DO IT ALL with a - -

SINGLE MACHINE.



DOES
IT
ALL

FOOD

MEAT

Vegetables
FRUITS,
CLAMS,
HASH, ETC.

PEANUT BUTTER,
CHOCOLATE,

DATES,
COCOANUT,
CRACKERS, ETC.

ONLY TWO PARTS TO CLEAN.

Manufactured by
O. D. WOODRUFF
Pottstown, Pa.



NO. 2 COMPOUND LEVER.

The Peoria Washers

are the strongest, best made machines for the purpose on the market to-day. They have Cedar Tubs with Galvanized Hoops. Inside castings, Tinned Malleable Iron. Leg brackets, malleable iron and bolted to tub with Tinned Bolts. Will wash as well as by hand, with less than $\frac{1}{2}$ the labor.

Manufactured by

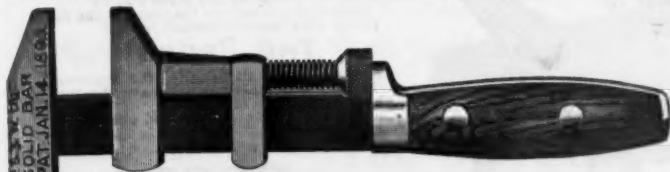
CLARK, QUIEN & MORSE,

402 S. WASH. ST., PEORIA, ILL.



NO. 3 ROTARY.

THE SOLID HANDLE WRENCH.



By actual tests the Strongest Wrench made.



This entire piece one solid steel forging.
Every Wrench Warranted.

Manufactured by
THE PECK, STOW & WILCOX CO.,
Southington, Conn., and New York, U. S. A.
Send for Circulars and Prices.

THE ONLY
Screw
Wrench
made with
the bar of
ONE PIECE
thus
securing
greatest
possible
strength.

Washing Machines,

CYCLONE
CHURNS,
SELF-MEAS-
URING OIL
PUMPS.

Write for Cat.

The Anthony Wayne
Man'g Co.,

Ft. Wayne, - Ind.



THE VERY BEST OUT.

Furnished in Round or Square.



Our Cedar Rotary

As now perfected is the most positive movement, the lightest running and the most satisfactory washer in existence. Runs forward or backward. No extra lifting to raise cover. Tub made of best cedar with galvanized trimmings. Has no clutches, springs or triggers to get out of adjustment. Everything strictly guaranteed. Also makers of

The Columbia and Western Washers.

BENBOW MFG. CO.,

13th and Wash. Sts., St. Louis, Mo.

The Schofield Bi-Treadle Grindstone.



BALL BEARINGS
or common U shaped
bearings.

Extra braces added to the
frame, making it perfectly
firm and substantial.

SIMPLE, EFFICIENT, DURABLE.

Foot Power Applied by
the Operator.

THE CLEVELAND STONE CO.,
CLEVELAND, OHIO.

WHITE MOUNTAIN
ICE CREAM FREEZERS

WORK QUICK,
SELL EASY,
HAVE THE
VERY LATEST
IMPROVEMENTS.

Many Exclusive Features.

Send for Catalogue.

The White Mountain Freezer Co.
Nashua, N. H.

Art of Coppersmithing

A Practical Treatise on Working
Sheet Copper in all Forms.

By JOHN FULLER, Sr.

327 Pages, 474 Illustrations, 7 x 10
Inches, Cloth. Price, \$3.00.

This work, prepared at great labor and expense, is reproduced from *The Metal Worker*, and forms an exhaustive treatise on the Coppersmiths' Art, being the only volume on that subject that has been published. It is beautifully illustrated with 474 pen and ink drawings, and is bound and printed in the best manner.

CONTENTS.

Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea Kettles; Oval Tea Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

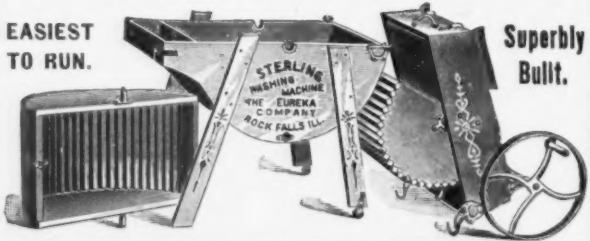
Sent post-paid upon receipt of price.

DAVID WILLIAMS CO., Publishers,

232-238 William St., New York.

THE STERLING DUPLEX WASHER.

EASIEST
TO RUN.



Superbly
Built.

Just Compare
that testimonial
with returns
from cheap
John washers.

Compare that
machine with
anything on the
market. No
washer made
equals the Ster-
ling Duplex for

genuine worth and ease of
operation

Here's a quality that counts
—a price that clinches busi-
ness. Write us to day.

THE EUREKA CO., Dept. G,
Rock Falls, Ills.

STREATOR, ILLS., April 12, 1900.
THE EUREKA CO. We have sold the Sterling
Washing Machine for the past few years and
will say that our sales are increasing in
spite of the competition we have with
cheaper goods. In construction the work-
manship is first-class and material of the
best. It does its work satisfactorily and its
easy running quality makes a demand for
it in families where the women or children
do not have the strength to operate other
machines. Yours respectfully,
HAMILTON & RUSSELL.

TRADE MARK.



"BOSS"

WASHING MACHINE

With Steel Frame Cylinder

Allowing $2\frac{1}{4}$ inch more space for clothes,
giving a better circulation of water through
the clothes, thereby cleansing them more
thoroughly than by any other washer.
Order sample and see for yourself the su-
perior advantages embodied in

THE "BOSS"

over any other. By handling the Improved
"BOSS" WASHER you will have the only
genuine and best ever made.

For complete description and prices send
for Circular "A."

Address the Manufacturers.

BOSS
WASHING MACHINE CO.,

308-318 Pearl St.,

CINCINNATI, OHIO.

CHICAGO WASHER

THE RETAILERS' FRIEND.

It does work no other can do. Because, two washboard-like surfaces moving
in opposite directions at the same time subject the clothes to a gentle and ef-
ficient rubbing. This effect is produced by pivoting the machine so that the rub-
bing device oscillates in the direction opposite to the oscillation of the Washer.

MADE OF CYPRESS.

Top closes tightly, keeping in sickening odors
of steam and soap-suds. Keeps the water hot,
prevents sickening odors. These machines are
not sold thro' jobbing houses, and ONLY TO ONE
DEALER IN A TOWN.

Secure territory now. These machines are war-
ranted to give entire satisfaction. Address

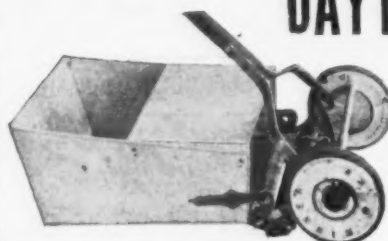
**Famous Manufacturing
Company,**

27 W. Randolph St., Chicago.



DAYTON GRASS CATCHER

Galvanized Iron. Weighs 6 lbs.



Will fit any size lawn mower and can be
attached in half minute's time. Strength,
durability and convenience guaranteed.
Write for descriptive circular and prices.

DAYTON GRASS CATCHER CO.,
Dayton, O.

Enterprise

PATENTED—
HARDWARE
—SPECIALTIES

Rapid Grinding and Pulverizing Mills



No. 2½, \$4.50



No. 5, \$8.00

20 Sizes & Styles for Hand & Power from \$1.25 to \$125.00

Meat and Food Choppers



No. 12, \$2.50



No. 1, \$1.25



No. 5, \$2.00

32 Sizes & Styles for Hand & Power from \$1.00 to \$275.00

Fruit, Wine and Jelly Press



No. 34, \$3.00

Bone, Shell & Corn Mill



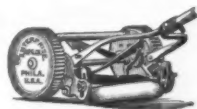
No. 750, \$7.50

Lawn Sprinkler



No. 1, \$3.50

Lawn Mowers

5 Sizes
7, 9, 11, 13 and 15 inches

Meat Juice Extractor



No. 21, \$2.50

Cold Handle
Polishing Irons

No. 82, \$0.75 per doz.

Descriptive Catalogue Free

ORDER FROM YOUR JOBBER

The Enterprise Mfg. Co. of Pa.

Philadelphia, Pa., U. S. A.

N. Y. Branch: No. 10 Warren Street



The Sterling Chopper

AND

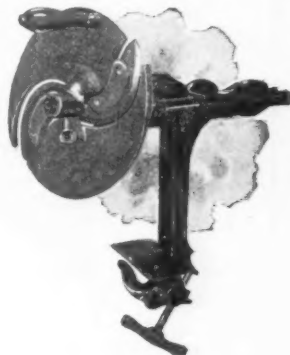
The Sterling Slicer.

TWO UNEQUALED KITCHEN TOOLS.

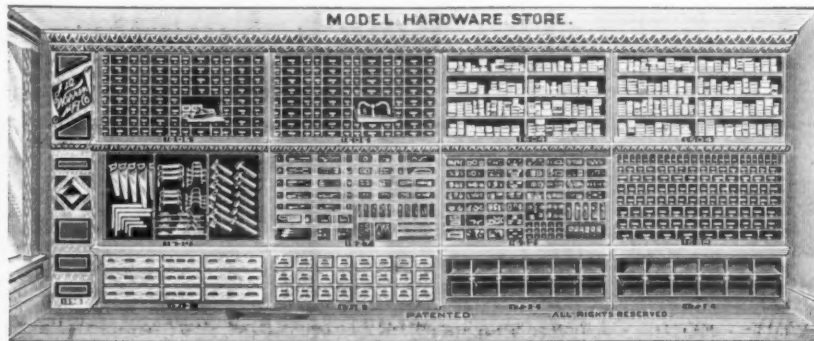
Have you seen the slicer? It's just out.

N. R. STREETER & CO.,

ROCHESTER, N. Y.



A
MODEL
HARDWARE
STORE.
WE
MADE
IT
SO.



IF
YOU
WANT
ONE
LIKE
IT
WRITE
TO-DAY.

J. D. WARREN MFG. CO., - - CHICAGO, ILLS.

A practical means of rapidly reaching absolutely accurate results without the mental wear of computing.

LADD'S DISCOUNT BOOK.

It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$3.00; Double Indexed Edition, \$4.00.

Mailed, post-paid, upon receipt of price by
DAVID WILLIAMS COMPANY,
232-238 William St., New York

Blue Flame Oil Cook Stoves

WICK
AND
WICKLESS.

In seven different styles. Low, medium and high, which for durability, simplicity, economy and convenience, are in all respects the best made.

For further information send for Catalogue to
THE DANGLER STOVE & MFG. CO.
CLEVELAND, OHIO., U. S. A.

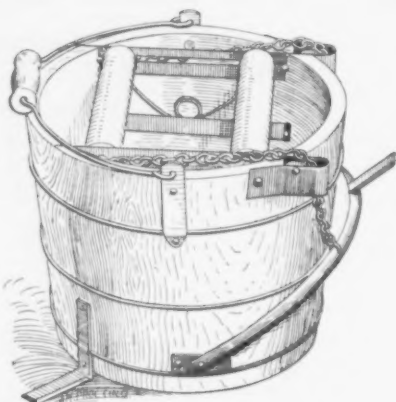


Helping the Dealer.
DO YOU REALIZE THAT THE
BELLAIRE STAMPING CO.,
have spent in the last ninety days over
\$25,000.00 in making the name of
COLUMBIAN Triple-Coated
ENAMELED WARE
a household word as far as Kitchen Utensils are concerned?
Is this ware on your shelves? If it isn't, you are
missing the quickest moving line that you could
carry. We have spent more money in making your
customers acquainted with this line than all other
manufacturers combined.

*Not
in
the
Trust*

OTHER LINES manufactured by us stand the same test of quality and value for the money as *Columbian Ware*. If Your Line is Broken. Why not send for *Free Sample and Catalog* of
CRESCENT, Gray Ware
DRESDEN, Blue and Gray Ware
COPENHAGEN, Blue and White Ware
COLUMBIAN Ware
and give us a trial order (no matter how small), and compare values with what you are now carrying?
BELLAIRE STAMPING CO.,
Harvey, Ills.

Keep Your Hands Dry. THE BEECH PATENT MOP WRINGER.



Our goods are made of the very best material, composed as follows:—CEDAR PALES, Seasoned Maple Rolls, Solid Brass Springs, Steel Chain and Side Bars, Wrought Iron Foot Holds and Levers, and two small pulleys of cast iron. All put together with screws. Entire weight ready for shipment, eight pounds.
Our Pails cannot dry out and fly apart, as they are put together with wire loops, sunk in grooves in the wood and welded by electricity. The wire springs are protected by iron guards from catching in the mop.
Our Wringers are so substantially built that they will last for years; in fact the whole device is made to stand the most severe and constant use.

—MANUFACTURED BY—

The Beech Novelty Company,
Mansfield, Ohio, U. S. A.



TWIN BUNG SPOUT

Insures an absolutely unimpeded flow from barrels of oils, syrups, paints, varnishes or other liquids. Once used always used.
Send for pamphlets and prices to the trade.
Cheapest spout on the market.

MFD BY
MIDDLETON & CO., 215 W. 2nd St., Philadelphia, Pa.



Queen Freezer. TRIPLE MOTION.

What's the use of turning some other freezer for 10 or 20 minutes when you can make far better cream in the QUEEN in 1 1/4 to 3 minutes? When you get a freezer get a good one—that's the QUEEN.

THE SAMUEL C. TATUM CO.,
264 Water Street, Cincinnati, Ohio.

New York Salesroom, 95 Chambers St., in charge of Tower & Lyon.

Steel Goods.

Door Hangers,
Door Track and Stay Rollers,
Door Hinges and Butts,
Felloe Plates and Washers,
Warehouse Trucks and Specialties.

McKINNEY MFG. CO.,

ALLEGHENY, PENN.



THE 1898 NATIONAL Sausage Stuffer and Lard Press,

(Patented September 14, 1897.)



NATIONAL SPECIALTY MFG. CO., Lehigh Ave. and Third St., Philadelphia, Pa.

ALASKA STOVE HARDWARE.

These handles are always cold, fine in finish, material of the best; they require no apology on the part of yourself or clerk to sell them. Sold by all first class Jobbers in Hardware.



MADE ONLY BY

Troy Nickel Works,
ALBANY, N. Y.

Send for Catalog.

Hudson's

Rocking Table Apple Parer

WITH PUSH OFF.

THIS Machine is so arranged that the Parings and Juice cannot fall upon it. Has an . . .

IMPROVED CLAMPING DEVICE

so that the table will not be jammed.

It is Stronger, More Durable, has Less Gears and Working Parts, will Pare Closer to the Fork, Keep Cleaner, Do Better Work and More of it than any machine in the market.

HUDSON PARER CO, Leominster, Mass., U.S.A.

Also Makers of Hudson's Little Star Parer, Corer and Slicer.

LIVINGSTON NAIL CO., Agents, 104 Reade St., New York.

SEND FOR PRICE.



SOLE MANUFACTURERS OF

STAR and BOSTON Heel Plates.

STARS MADE IN FIVE SIZES.



BOSTONS MADE IN FOUR SIZES.

Patent Reversible Iron Stands and Jacks.

Shoe Repairing Outfits.



Knife Sharpeners.

Hammers, Hob Nails, Lap Lasts, Spring and Revolving Punches, &c.

STAR HEEL PLATE CO.,

63-81 Polk St., NEWARK, N. J.

WRITE FOR PRICES.

HEADQUARTERS...

For the Largest Variety of

HIGH GRADE FAMILY **COFFEE MILLS**



Of best quality, latest designs, and fine finish. Also a full line of Patented Household Novelties of superior quality and merit.

Light Builders' Hardware, Etc.

Send for our 1899 Catalogue.

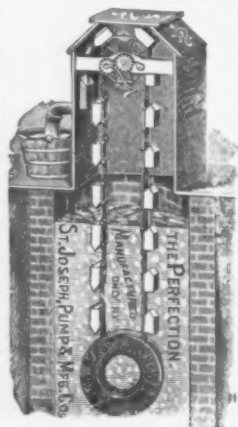
THE X RAY,

A one-pound Coffee Mill with wood frame and glass front. Patent pending.

Something Entirely New. The House-keeper's Delight.

ARCADE MFG. CO., Freeport, Ill.

THERE IS BUT ONE MAKE
OF THE
"Perfection"
Bucket Pump

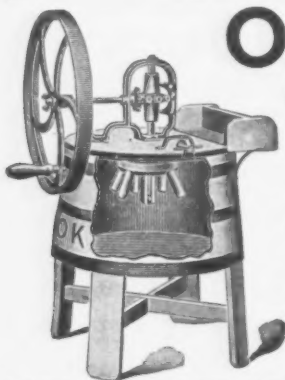


but it is handled by all first-class Hardware, Pump and Implement Jobbers.

Constant attention to its manufacture insures to consumers, through the trade, a **WATER PURIFIER** that charges cisterns and wells with fresh air every time water is drawn. Send for sample to-day. Its

merits can be demonstrated at sight. Catalog free.

St. Joseph Pump & Mfg. Co.,
ST. JOSEPH, MO., U. S. A.



O. K.
Rotary
Washer

has revolving steel ball gearing, making it noiseless; thus superior to others. Wheel continues one direction, the stirrer in both directions. Lid closes tight. No escape of steam.

Worked by hand or belt. Write for Circulars Prices, etc., to

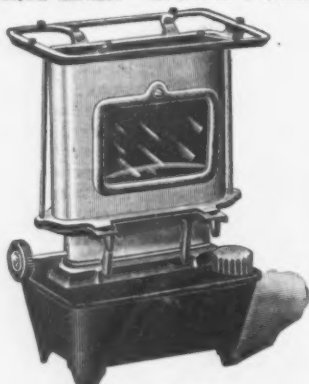
H. F. BRAMMER MFG. CO.,

Mention this paper.

DAVENPORT, IA.

LAMP STOVES

FOR EXPORT.
LARGE LINES. SPECIAL PRICES.



J. M. LITCHFIELD,

104 BEEKMAN ST.,

NEW YORK.



Patented Oct 3, 1899.

Oefinger's Burglar Proof Sash Locks will lock windows when left partly open, permitting ventilation.

J. L. OEFINGER,
Manufacturer,
7 & 9 So. Jefferson St.,
Chicago, U. S. A.



THE LARGEST LINE OF
Ice Tools and
Lemon Squeezers

MADE IN THE UNITED STATES

ARE MANUFACTURED BY

A. C. WILLIAMS,
RAVENNA, OHIO, U. S. A.,

To whom send for catalogue of

House Furnishing Specialties
and Hardware.

SURPLUS, DUNN & CO.,

55 Warren Street, - New York.
Export Sales Agents.

THE TOLER LIQUID DOOR CHECK
AND SPRING.

Perfection Attained at Last.



Entirely new in style and mechanism, strong, simple and effective, giving in results all the best achievements of other checks, together with new and valuable features only to be found in this. It has a vertical case, with openings only at the top. It has no plugs or caps screwed to the cylinder ends. It cannot leak. There is no way for the liquid to escape after the Check is applied.

The piston is idle during a greater part of the opening and closing of the door, thus saving the wear on all parts.

It is made of the very best of material throughout. It works to perfection, closing the door quickly and gently.

It is easily taken apart by anyone; no returning to the factory for anything. This saves time and money. The working of the Check will speak for itself.

Regular finish, Gold Bronze. No extra price for Silver Bronze or Dead Black when so ordered. Furnished Plated in Brass, Nickel, Copper or Silver, Plain or Oxidized, at a reasonable extra charge. No extra charge for Brackets where needed.

Manufactured by

JOHN TOLER, SONS & CO.,

NEWARK, N. J., U. S. A.

W. H. QUINN & CO., General Agents, No. 103 Chambers St., NEW YORK.

THE
BROHARD —
— DOOR HOLDER



PATENTED Oct. 28, 1888,
Aug. 5, 1890

OPERATED BY THE FOOT.

Over 3,000,000 in use in the United States

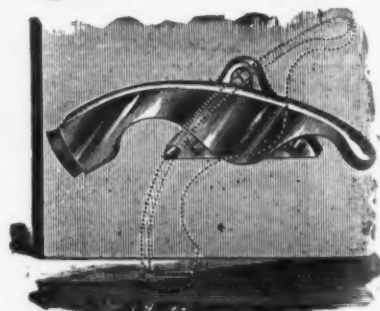
Pronounced by building experts to be the

ONLY PERFECT DOOR HOLDER MADE

Made in three sizes and all finishes.

THE BROHARD COMPANY,
Hutchinson St. and
Columbia Avenue,
PHILADELPHIA, PENNA.

Empire Door Holder.



Operated by a light pressure of the toe. No bending over. The Rubber Tip and Spring Action make it particularly desirable for use on carpet, polished wood or tiled floor.

MANUFACTURED BY

CALDWELL MFG. CO.,

ROCHESTER, N. Y., U. S. A.



Stowell Mfg. & Fdg. Co.
South Milwaukee,
Wis.

CATALOGUES.

- No. 1, GENERAL.
- No. 2, REGISTERS.
- No. 3, RAILROAD HANGERS.
- No. 4, WIRE WORKERS' GOODS.
- No. 5, HANGERS AND RAIL.
- No. 6, MALLEABLE HARDWARE.

STOWELL Parlor Door Hanger.

Recommended
by
Architects.



Easily
Adjusted.

WRITE FOR PRICES.

Nothing So Successful As Success.

THAT'S WHY SO MANY DEALERS BUY
WILCOX MFG. CO.'S DOOR HANGERS,
MADE BY

WILCOX MFG. CO., AURORA, ILL.

The Lyon is the Best Egg Beater and Cream Whip

IN THE WORLD.

Some always want the best if they can
find it.

It Whips—

1 egg in 10 seconds.

3 eggs in 20 "

6 " " 40 "

12 " " 90 "

Whip 1 pt. cream in 3
minutes.



NELSON LYON, Mfr.,
52 Green St.,
ALBANY, N. Y.

HARDWARE DEALERS

Can now make
money handling
washers. Our

HORTON
ROTARY



is a success with the trade. That means it is a
washer that sells easily and stays sold, and pro-
vides the dealer a profit. Write us for prices.

HORTON MFG. CO.,
Ft. Wayne, Ind.



Reliable

VAPOR STOVES,
GAS RANGES,
STEEL RANGES.

THE SCHNEIDER & TRENKAMP CO.,
Chicago, Illinois. Cleveland, Ohio.

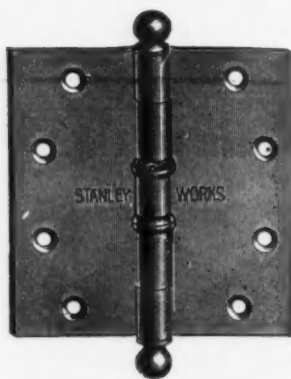
A Customer Writes:

"Some months ago we purchased a number of your ball bearing butts. The doors supported by these butts were large and heavy and the butts worked very successfully."

This is the universal testimony of all who have used these butts. It is for the interest of up-to-date hardware dealers to have them in stock.

A postal will bring you an Artistic Booklet.

The Stanley Works, Dept. F, NEW BRITAIN, CONN.
79 Chambers St., N. Y.



The Lawrence Steel Strap Hinge.



THE LATEST, NEATEST, STRONGEST. The altogether BEST ON THE MARKET. Made from the finest grade of Hinge Steel, cut with the grain, full width at the pintle, gives this hinge three times the strength of the common strap hinge.

WRITE FOR CIRCULARS AND PRICES.

LAWRENCE BROS., STERLING, ILL.

Manufacturers of Steel Door Hangers, Hinges, Pulleys, and other Hardware Specialties.

The Walda Sectional Window Weight.



Square and Round Weights. Hang exactly from centre. Only 10 inch pockets required. Eliminates use of lead weight.

The Hardware Dealer

with one-sixth the stock required in one piece weights can fill any order. Weight crated with 100 lbs. in a box, both plainly marked.

The Contractor

saves time, money and delay by balancing windows exactly at once.

SEND FOR CIRCULAR.

Barney & Reed M'fg Co.,

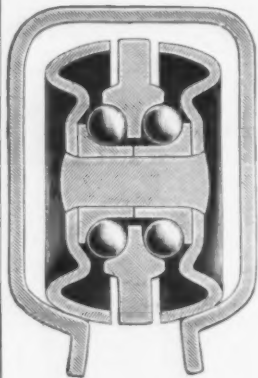
85 Water Street, - BOSTON, MASS.

SASH WEIGHTS.

E. E. BROWN & CO.,

McKean and Meadow Sts.,

PHILADELPHIA, - - PA.



TO SECURE THE BEST DEVICE ON THE MARKET FOR HANGING SLIDING DOORS ORDER THE McCABE BALL BEARING DOOR HANGER. WRITE FOR CATALOGUE AND PRICES. SPECIAL DISCOUNT FOR STOCK ORDERS. THE McCABE HANGER MFG. CO., 540 W. 22d ST. NEW YORK.

United States Steel Lock Co.,
CLINTON, IOWA,
SOLE MAKERS

WARNER LOCKS.

LOCKS.

HARDWARE.

Cold Rolled Steel.
Accurate in Construction.
Unsurpassed in Quality.

Artistic in Design.
Elegant in Finish.
Moderate in Price.

Items from Norwalk.

WE show here a cut of a new *Colonial Design* known as "*Fairfield*." We make a complete line of *House Trimmings* in this design, and have ready for distribution a *Booklet* fully describing the separate pieces, also showing it in Lock Sets for Inside and Outside doors. Better write for one.

NORWALK LOCK CO.,

South Norwalk, Conn.

No. X8140 "Fairfield"
Store Door Set.

NEW YORK.

BOSTON.

NO ADVANCE IN PRICES.

L
A
R
I
M
E
R



AUTOMATIC
DOOR CHECK
AND SPRING.

Simple, Durable,
Noiseless, Ornamental
and the Price is Right.

Suitable
for all
Classes
of
Doors.

Office and Factory:
LATROBE, PA.

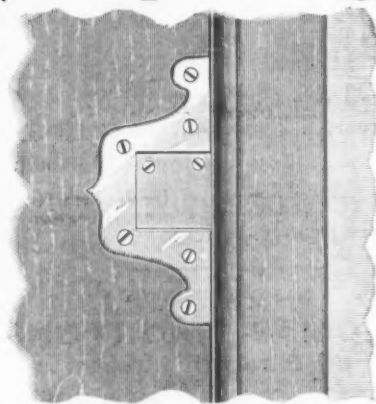
Manufactured by
LARIMER MFG. CO.

Chicago Office: 68 NORTH STATE ST.

The Easy Spring Hinge

Equalizes the pressure at all points, permitting the door to return to its initial point slowly and easily. This is a radical departure from all other similar constructions. The door once adjusted is always in line. There are no unsightly springs or parts visible. There's no sagging of the door possible, and many other good features embodied in the "EASY" which will commend themselves upon examination. Write for descriptive matter.

EASY SPRING HINGE CO.,
Shelby, Ohio.



M

CHICAGO
SPRING BUTT
COMPANY.



MANUFACTURERS OF

SPRING HINGES,

DOOR SPRINGS,

DOOR PULLS,

KICK OR

PUSH PLATES,

HOUSE NUMBERS,

B. D. HANGERS.

RELIABLE GOODS.

PROPER PRICES.

PROMPT DELIVERY.

SEND FOR CATALOGUE.

CHICAGO.

NEW YORK.

IDEAL DETACHABLE

HOLD BACK
SPRING HINGE



Makes putting up and taking down Screen Doors an easy matter. The door is held as securely as by the old way, and is put up or taken down in a jiffy by simply turning the button.

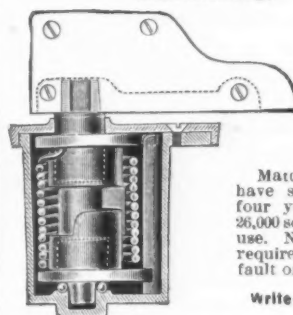
Ask for further particulars and free sample.

STOVER MFG. CO.,

Freeport, Ill., U. S. A.

145 River St.

THE MATCHLESS
Double - Acting Floor Hinge.
Ball Bearing.



Matchless Hinges have stood the test four years. Nearly 26,000 sets are now in use. Not one set has required repairs from fault of Hinge.

Write us for prices.

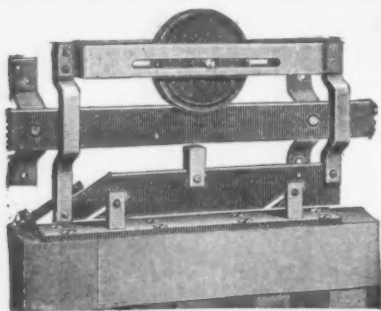
LAWSON MANUFACTURING CO.,

MAIN OFFICE,

Chicago.

Milwaukee, Wisconsin

New York.



"Lane's Standard"

Is the Original Steel
Single Rail

Parlor Door Hanger

The most popular Hanger to-day, because it is
ALL steel and substantially and well built on
correct mechanical principles.

It Gives
Satisfaction.

Manufactured by **Lane Brothers Co.,**

Prospect and River Sts.,
POUGHKEEPSIE, N. Y.

**NO
NAILS**
**N
O
O
K
S
E
L
B
E
S
T**
**JUST
BORE**

No. 3,
2 1/2 in.
Wheel.



"FOX-ALL-STEEL" The Original

and **THE ONLY STEEL SASH PULLEYS**
provided with a **DURABLE BUSHING** in the
wheels **TO TAKE THE WEAR.**

Two Styles in Two Sizes now made.

No. 7 and No. 9 Pulleys have

INTERLOCKING FASTENERS

which "Hold" them firmly.

No. 7 Pulleys, 3 1/4 in. wheel, for **EITHER** a Four-
Hole or Machine Mortise.

No. 9 Pulleys, 1 3/4 in. wheel, for **EITHER** a THREE-
Hole or Machine Mortise.

FOX PULLEYS are **NOT EX-ER-MENTS,**
but have been in extensive use for
OVER EIGHT YEARS.

Drop us a line for catalogue

Why not make a trial of our Pulleys?

SAMPLE PULLEYS FREE.

**FOX MACHINE CO., 387 NO. FRONT ST.,
GRAND RAPIDS, MICH.**



**NO
SCREWS**

**W
E
A
R
B
E
S
T**
**S
E
L
L
B
E
S
T**

**4
HOLES**

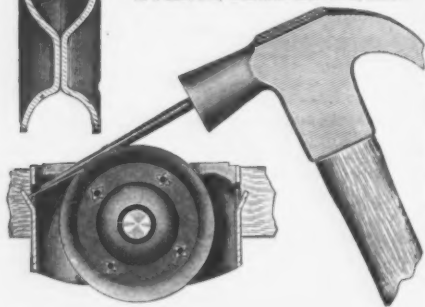
2 3/4 in. For **EITHER**
a Four-Hole or Machine
Mortise.



**THE
GRAND RAPIDS**
are the only

All-Steel Sash Pulleys
having a polished steel bushing running
on a turned steel shouldered axle.
The Grand Rapids wheel is inter-
aced at four points. It cannot split.
This important feature is found only in
the Grand Rapids. Samples Free. No
Screws. No Nails.

Grand Rapids Hardware Co.,
21 Pearl St., GRAND RAPIDS, MICH



Pullman Sash Balance Co.,



**MAKERS
OF THE**

"Pullman" Hardware Specialties

MAIN OFFICE AND WORKS,

Rochester, N. Y., U. S. A.

HALT!

HARDWARE DEALERS

CAN RECOMMEND

MORTON'S BRONZE AND STEEL CABLE SASH CHAINS

As the best substitute for sash cords
ever made. Some in daily use over
25 years. These chains are easily
applied to any window. Will run
equally as well on either round or
square groove pulleys.

MANUFACTURED BY

THOMAS MORTON,
65 Elizabeth Street,
NEW YORK.



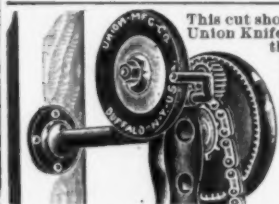
**THE
"CZAR."**

Sole manufacturers
of the "CZAR,"
only Bicycle Ball
Bearing Hanger
Made.

Also complete line of

Roller Bearing Hangers,
Steel Track and Stay Rollers,
Champion Spring Hinges,
Harper and Nickel Stove Caster,
Toy Banks and Sad Irons,
Shumard Sash Balance,
Fine Castings of all kinds in
Brass and Iron.

**COLEMAN HARDWARE CO.,
CHICAGO.**



This cut shows the head of our
Union Knife and Tool Grinder,
the best foot-power
grinder on the
market. Curious
ball clutch, fully
warranted. Price,
\$5.00. Discount.
Send for circular.
**UNION MFG CO.,
Buffalo, N. Y.**
Mfrs. of Hdw.
Specialties.

SILVER LAKE SASH CORD

Has been the standard for thirty years.



Every Hank Bears the Above Label.
SEND FOR SAMPLE.

The Reliable and Popular

"H. & R. Automatic" Double Action

Is made

in 32 and 38 Calibers, with
3¼, 4, 5 and 6 inch Barrels,
taking the Center Fire S.
& W. Cartridge.

For Complete Illustrated Catalogue,
address the manufacturers:



IT IS SOLD

by the leading dealers in

Fire Arms,

Hardware and

Sporting Goods

throughout the world, and
none can afford to be with-
out it.

HARRINGTON & RICHARDSON ARMS CO., Park Ave. and
Chandler St., Worcester, Mass., U. S. A.

SASH WEIGHTS, IRON and LEAD,

ENTERPRISE FOUNDRY CO., Tel. 5292.
CINCINNATI, O.

Ventilators, Valve Stop Boxes, Hydrant Boxes, Meter Boxes,
Washers, Special Sizes Iron and Lead Weights to Order,
and all Kinds of Castings.



The Phenix Hanger

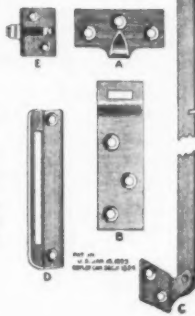
Solves the Problem HOW TO
HANG Storm Windows and
Entire Screens. * * *

It's the "Housewife's Joy"
FOR CLEAN WINDOWS.

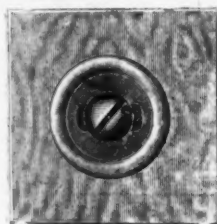
Ideal Ventilation. No Flies Solid Comfort

Storm Windows and Screens are hung or re-
moved with ease from inside at any time, by
any person. Sold by all Hardware Dealers. For
Descriptive Catalogue address

PHENIX MANUFACTURING CO.,
032 Center St., Milwaukee, Wis.

TAPLIN'S
PERFECTION

WINDOW STOP ADJUSTER.



ORNAMENTAL
USEFUL
ECONOMICAL

Gives a
FINE FINISH.
Prevents RATTLING or
STICKING of Window Sashes.
Keeps out COLD and
DUST.



A STAPLE ARTICLE.

A Perfect Adjuster for Sliding Door Stops.

Finished in Solid Bronze, Oxidized Copper,
Nickel and Gold Plate, or as ordered. Securely
packed, with screws to match. To fasten in stops,
simply bore ¼-inch hole and they will drive in
just right. New Lists and Discounts.

Send for Samples and Prices.

Bath Room and Toilet Specialties in Nickel.

THE TAPLIN MANUFACTURING COMPANY, FORESTVILLE, CONN.,
90 Chambers Street, New York.

PAT. July 13, 1897.

Price,
\$3.00.



Columbia Automatic

IS A WINNER!

JOBBER, ATTENTION!

Simplest Construction, Adjustable Flame, Bright-
est Light, Automatic Water Feed, Removable
Straight Burner. Lights at Once, Self-Cleaning
Water Valve, Burns from 4 to 10 hours.

It is very economical in the use of carbide, and the
same charge can be used repeatedly until ex-
hausted. The carbide chamber is made of two
pieces, which are telescoped and expands with the
carbide as the charge is used and is practically a re-
loading cartridge, allowing an extra charge to be
carried for exceptionally long rides.

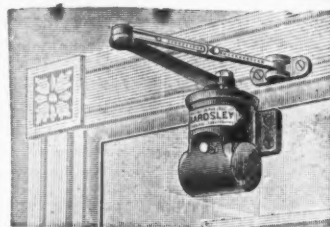
HINE-WATT MFG. CO.,

14 & 16 N. Canal St., CHICAGO, U. S. A.

Patents Allowed 1900 Model.

Our Electros are Ready.

THE "BARDSLEY" Oil Door Check and Spring



HAS new and improved features; is free
from packing friction; the checking
power can be released when the door is
near the closing point; more oil can be
added when needed without taking it
from the door and it can be readily taken
apart with the aid of a screw-driver when
repairs are necessary.

Size A,	price each,	\$3 50
" B,	" "	4 00
" C,	" "	5 00
" D,	" "	6 00
" E,	" "	7 00

LIBERAL DISCOUNTS TO THE TRADE.

JOS. BARDSLEY,

147 to 151 Baxter St., NEW YORK CITY.

Palmer's Common Sense Frame Pulley.



MANUFACTURED BY

PALMER HARDWARE MFG. CO.,
TROY, N. Y.

Fine Fishing Tackle

OUR ASSORTMENT CONTAINS ARTICLES EVERY DEALER SHOULD HANDLE.

A comparison of our Prices with those you are paying
WILL INTEREST YOU.

OUR NEW CATALOGUE READY MARCH 20th.

Dame, Stoddard & Company,

BOSTON, MASS.

Davis & Burton Stamping Co.

No. 3 Cypress, cor. Exchange St., Worcester, Mass.

Send sample or drawing of what you may need in
Stampings for our quotations on same.



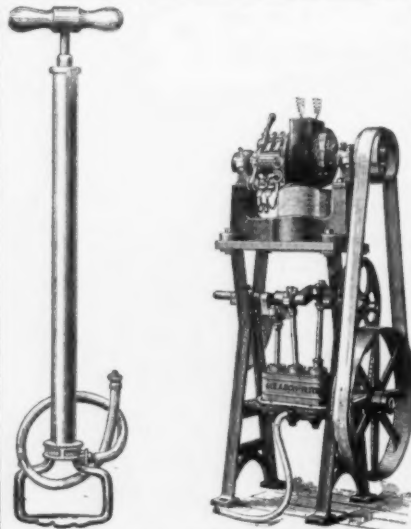
WHATEVER may be your chief aim in cycling, you will find an ideal mount in the **COLUMBIA BEVEL-GEAR CHAIN-LESS**. Models 59 and 60, \$80; Models 65 and 66, \$75.

Columbia, Hartford, Stormer and Pennant

Chain Wheels have every improvement known to machines of their type, each containing the highest possible value for its price. New Models, \$50, \$35, \$25.

The **Columbia Coaster Brake**, for either chainless or chain models is the greatest labor-saving device applicable to the modern bicycle. Price \$5.00 with 1900 machine of our own make.

COLUMBIA BICYCLES,
HOME OFFICE, - HARTFORD, CONN.



AIR PUMPS

of every description for Bicycles, Automobiles, etc. Hand or Power. Gas Filters, Proving Pumps, Vacuum Pumps, Pumps and Compressors for experimental purposes.

Gleason-Peters Air Pump Co.,
Houston and Mercer Sts., New York.

Bicycle,
Sleigh, House,
Hand,
Trip and
Rotary Door

BELLS

Send for Catalogue and Price-List.

Starr Bros. Bell Co., Easthampton, Conn., U.S.A.

STERLING BELLS.

Continuous Ringing



With
Rotary
Movement
and Non-
Revolving
Gongs.
Best on
Earth.

Send for catalogue "A."

N. N. HILL BRASS CO.,
East Hampton, Conn.

MANUFACTURERS OF...



Bells

of all descriptions;
also BICYCLE
SPECIALTIES.

Established in 1838.

AUTOMOBILE BELL.

Bevin Bros. Mfg. Co.,
EAST HAMPTON, CONN.

Springfield Drop Forging Co.

SPRINGFIELD, MASS., U.S.A.
P. O. ADDRESS, BRIGHTWOOD, MASS.



TOOL POSTS.
TOOL POST RINGS.
TOOL POST WRENCHES.
LATHE CHUCK WRENCHES.



BICYCLE AND
SPECIAL
DROP FORGINGS
OF ALL KINDS.



BICYCLE
WRENCHES.



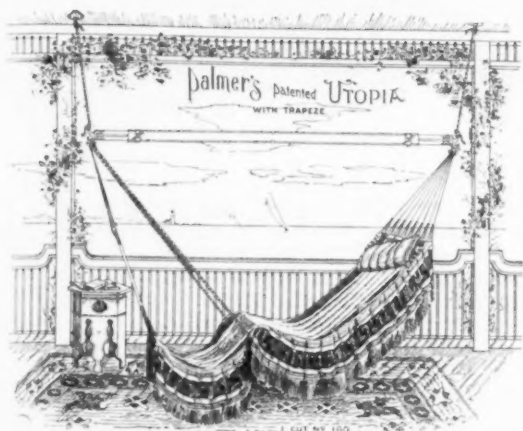
HIGH CLASS

DROP FORGINGS.

STRIEBY & FOOTE CO.,

NEWARK, N. J.

PALMER'S PATENTED HAMMOCKS.



AS USED ON A VERANDA.



AS USED WITH SUPPORT.

PERFECTION, ARAWANA, UTOPIA.

Hammock Supports, Hammock Awnings, Hammock Mosquito Canopies, Trapeze Suspension Bars.

LARGEST Variety of Patterns, Colors and Accessories. Also Manufacturer of CANOPIES, MOSQUITO NETTINGS, CRINOLINE DRESS LINING, WINDOW SCREEN CLOTH, SCHOOL BAGS, etc., etc.

Send for Our New Catalogue for 1900.

I. E. PALMER, Middletown, Conn., U. S. A.

NEW YORK OFFICE, 62 White Street.

INFRINGERS ARE BEING PROSECUTED.

STEEL FOR PRESSED, STAMPED, DRAWN AND PLATED WORK.

ESTABLISHED 1877. INCORPORATED 1884

The WILMOT & HOBBS Mfg. Co.

MANUFACTURERS & EXPORTERS OF
BEST SOFT, EXTRA SOFT & SPRING, BESSEMER
& OPEN HEARTH, HOT ROLLED, ANNEALED & PICKLED, ALSO
BRIGHT COLD ROLLED "SWEDON" STEEL.

UNEXCELLED FOR PRESSED, STAMPED,
DRAWN & PLATED WORK.

NICKEL PLATED RINGS FOR STOVES
NICKEL PLATED STEEL
STOVE EDGE TRIMMINGS

UNMOUNTED
GDNC
Taps With A-1, Nickel Plate

CRUSHING TEST

WILMOT'S
PATENT
"CLINCHER" CYCLE TUBING
STRONGER THAN THE SEAMLESS.

WE MAKE A SPECIALTY OF
WILMOT'S PATENT SPRING STEEL BEDSTEAD TUBING
OF SUPERIOR FINISH, LIGHTNESS & STRENGTH.

ENGINEERS' & STEAMBOAT SETS, "COPPERIZED" ALSO NICKEL,
BRASS-PLATED & JAPANNED.

BRANCH OFFICE:
POSTAL TELEGRAPH BLDG., NEW YORK.

MAIN OFFICES & WORKS:
BRIDGEPORT, CONN., U.S.A.

COLD ROLLED STRIP STEEL.

Patent "Cliche" Fifty Carbon "SWEDON" Spring Steel Cycle Tubing.

THE ORIGINAL 25 Calibre Repeater



THE 25-20 MARLIN is one of the handiest arms made and accurate to 300 yards, with light report and little recoil. Its bullet is more reliable than a 22 calibre and the barrel does not foul as rapidly. It will kill cleanly and quickly without tearing. Smokeless powder can be used in a large variety of loads, and the ammunition is cheap.

ALL MARLINS

Rifles or Shot Guns, have a SOLID TOP ACTION and eject at the side.



OUR CATALOG, an illustrated encyclopedia on arms and ammunition, with colored cover by Osthaus, mailed for 3 stamps.

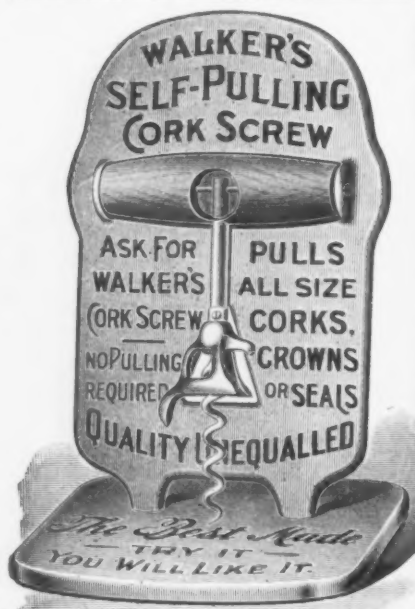
THE MARLIN FIRE ARMS CO., New Haven, Ct.



BUNDY LAMP.

Absolute Water Control.
Even Flame.
Can't Jar Out.
Can be relighted repeatedly.
Burns Loose Carbide.

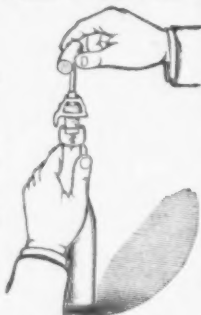
Write for History of
The Bundy Lamp Family,
Elmira, N. Y.



THIS FINE **AD. FREE** with a Gross Order.

SEE!

You Don't Have to Pull.
A Child can do it.
No Agitation of Contents.
No Overflow of Bottle.



Catalogue showing many styles of

Cork Screws, Cork Pullers, Ice Shavers, Picks, Lemon Squeezers, etc.

ERIE SPECIALTY CO., Erie, Pa.



WE manufacture the goods shown in our three catalogues.

RED Catalogue of Hay Slings and Hay Carriers only.

WHITE Catalogue of Lawn Swings and Lawn Seats only.

and

BLUE Catalogue of Ladders only.

WHICH ONES DO YOU WANT?

THE GOSHEN MFG. CO.

611 Reynolds St., Goshen, Indiana, U. S. A.



IF YOU SHOOT A RIFLE
Pistol or Shotgun, you'll make a Bull's Eye by sending three 2c. stamps for the Ideal Hand-Book, 128 pages **FREE**. The latest Encyclopedia of Arms, Fowling, Shot and Bullets. Mention Iron Age. Address **IDEAL MFG. CO., New Haven, Conn., U. S. A.**

THE THREE REQUISITES OF A PERFECT GUN,
BALANCE, EVEN PATTERN AND PENETRATION,
Can only be obtained after years of experience.



THE REMINGTON HAMMERLESS

is backed by nearly a century's experience, and the success that rewards the man who shoots a Remington proves that our efforts have not been in vain.

SEND FOR CATALOGUE.

REMINGTON ARMS CO.,

315 Broadway, N. Y.

Ilion, N. Y.

Common Sense Re and De Capper

10 AND 12 GAUGE

One Tool for Two Gauges

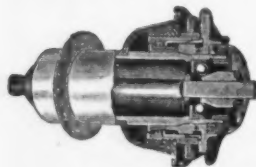
\$1.50 Each

WILL Re and De Cap any of the New High Grade Paper Shells of any make.

WRITE TO

THE BRIDGEPORT GUN IMPLEMENT CO.

313 and 315 BROADWAY, NEW YORK.



Ride 50 Miles and
Pedal Only 35.

Fits Any Bicycle.

...THE...

Morrow Coaster AND Brake

Price, \$7.50.

WRITE FOR CIRCULAR AND PRICES.

MADE ONLY BY

ECLIPSE BICYCLE CO., Elmira, N. Y., U. S. A.

New Castle Shovel Co.,

NEW CASTLE, PA.,

A Large Stock of Shovels, Spades and Scoops in Stock for Immediate Delivery.

Correspondence Solicited.

REPRESENTATIVES:
J. C. McCARTY & Co., No. 10 Warren St., New York, N. Y.
118 Lake St., Chicago, Ill.

MANUFACTURERS OF

SHOVELS, SPADES and SCOOPS.

ALLERTON, CLARKE & Co.

EDWARD MILLER & CO.'S BICYCLE LAMPS FOR 1900.

OIL BICYCLE LAMP.

GAS BICYCLE LAMP.



A Wonderfully Good Lamp for a Little Money.

ISN'T IT WISE

to supply your trade with articles which are made by a concern that has the reputation of making Good Goods which are fully guaranteed?

Isn't this particularly true of Acetylene Gas Lamps, for a poor Acetylene Gas Lamp is absolutely worthless? Isn't it wise then

TO "CATCH ON" TO

that lamp which is made by a concern who have been making lamps of all kinds for years, and who, therefore, "know how?" Ask your customers which Gas Lamp gave them the best satisfaction in 1899, and they will say

The MAJESTIC.

Send for New Catalogue No. 70.

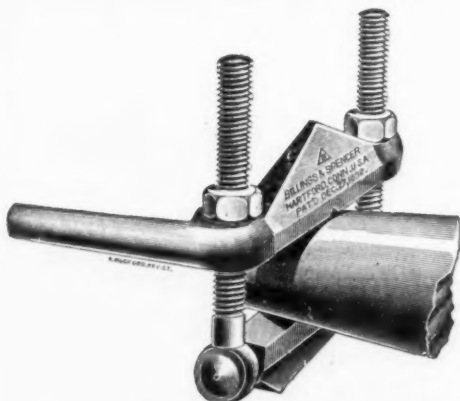
EDWARD MILLER & CO., Meriden, Conn., U. S. A.

MAKERS OF LAMPS FOR ALL PURPOSES.



See New Features

Something New.



CLAMP DOG

WITH SWIVEL JAW.

No. 1. 1 1/2 inch between screws.

No. 2. 2 1/2 " " "

No. 3. 2 1/2 " " "

THE BILLINGS & SPENCER CO.,
HARTFORD, CONN.

STRONGER.
CLEANER.
MORE
ACCURATE.
LESS NOISE.
LESS SMOKE.

Peters Cartridges
LOADED WITH

King's Semi-Smokeless Powder

ABSOLUTELY
SUPERIOR
TO ALL
OTHER
MAKES.

THE PETERS CARTRIDGE CO., Cincinnati.

EASTERN BRANCH, No 80 Chambers St., New York.

HIBBARD, SPENCER, BARTLETT & CO., Chicago.

C. G. GRUBB, Agt., Pittsburg.

A. L. PETERS, Agt., St. Paul.

F. B. CHAMBERLAIN COM. CO., St. Louis.

ASK FOR PRICE LIST AND BOOKLET.

Ladd's Discount Book is a practical means of rapidly reaching absolutely accurate results without the mental wear of computing. It gives at a glance the net of any sum at a great range of discounts, simple and complex, and it is accurate, rapid and practical. Price, \$3.00; Double Indexed Edition, \$4.00.

Mailed, postpaid, upon receipt of price by
DAVID WILLIAMS CO.,
232-238 William St.,
New York.

ACCURATE AND RAPID.



WITHINGTON & COOLEY

Manufacturing Co.,

JACKSON, MICH., U. S. A.

LARGEST AND MOST COMPLETE LINE OF

Hoes, Forks, Rakes, Hooks, Etc.,

MANUFACTURED.

QUALITY, DESIGN, WORKMANSHIP AND FINISH UNSURPASSED.

Send for Illustrated Catalogue.

Messrs. BALDWIN, ROBBINS & CO., of Boston, Mass., carry a full line of our goods and are a convenient source of supply for the New England trade.



Turf Nails, Nos 1 to 5.



French Heads will fill any shoe punched or creased.
Nos 3 to 8.



Regular Heads, Nos 5 to 14.



City Heads, for shallow creased shoes, Nos. 5 to 8.



Counter Heads or Frost Nails, Nos. 5 to 9.



PUTNAM NAILS.

Putnam Hot Forged and Hammer Pointed.
Neponset Hot Forged and Sharp Pointed.

The Neponset is produced by the same method and of the same material as the Putnam with the exception that it is sharp pointed.

Trade correspondence solicited.
For terms and discounts address

PUTNAM NAIL CO., Boston, Mass.

Or { 235 Lake St., Chicago, Ill.
12-14 Drum St., San Francisco, Cal.

U. S. SPRING CLOTHES PIN.

The only pin on the market which **CLASPS** the clothes on the line and holds them until unlocked. Will not damage the most tender fabric.

Packed in one gross cartons and shipped in strong cases for transportation to foreign countries.

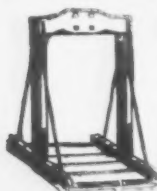


We Sell Direct to the Trade without
Traveling Salesmen

SEND FOR PRICES.

UNITED STATES CLOTHES PIN CO.,

Montpelier, Vt., U. S. A.



Hand Elevators and
Dumbwaiters

made to be sold by the Hardware trade. Can be placed in position by any carpenter. Catalogue free.

ENERGY MFG. CO.,
408 Cherry St., Phila. Pa.

RICHARD ECCLES, Auburn, N. Y.,
MANUFACTURER OF

CARRIAGE AND BICYCLE FORGINGS.



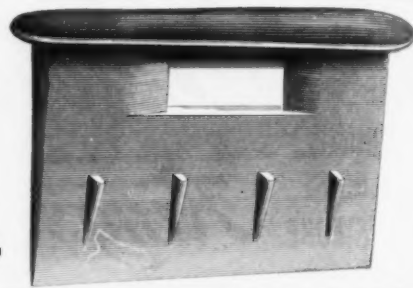
Send for Catalogue Issued May 1, 1898.

MALLEABLE IRON

Axe Wedges,

Eagle Screw Clamps,
Mount Carmel Ox Shoes,
Storm Window Fasteners,
Malleable Iron Castings,
Carriage Mountings.

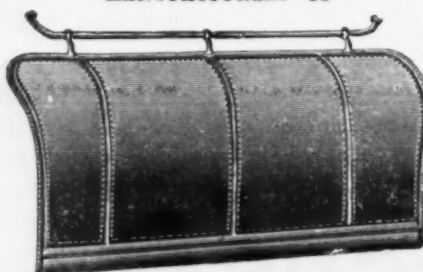
The WALTER W. WOODRUFF & SONS CO.,
Mount Carmel, Conn., U. S. A.



McKINNON DASH CO.,

MANUFACTURERS OF

Dashes,
Fenders,
Roll Up Straps,
Prop Block
Washers
and
Shaft Leathers.



"V" PATTERN.

Largest Capacity
in the World.

Factories at
Buffalo, N. Y.,
Troy, O.,
Cincinnati, O.,
Syracuse, N. Y.,
St. Catharines, Ont.

Store at
Cincinnati, O.

The Scranton Forging Co.,
Scranton, Pa.

DROP FORGINGS TO ORDER.

CHAMPLAIN

ALL SIZES.
ALL PATTERNS.
ALL WARRANTED.
SOLD EVERYWHERE.

J.C. McCarty & Co.,
Agents,
New York.



Send for Price and
Illustrated List.

Manufactured by
NATIONAL
HORSE NAIL CO.,
VERGENNES,
VERMONT

RHODE ISLAND PERKINS HORSE SHOE CO.,
MANUFACTURERS OF
HORSE AND MULE SHOES OF THE PERKINS PATTERN
SPECIALTIES: X L Steel Shoes, Tee and Side Weight Shoes and
Goodenough Shoes.

Works at VALLEY FALLS, R. I.
F. W. CARPENTER, Pres.

Office, 112 Industrial Trust Building, PROVIDENCE, R.
C. H. PERKINS, Gen. Manager. R. W. COMSTOCK, Sec'y.
CHARLES R. STARK, Treas.



THE IRON
WE USE.

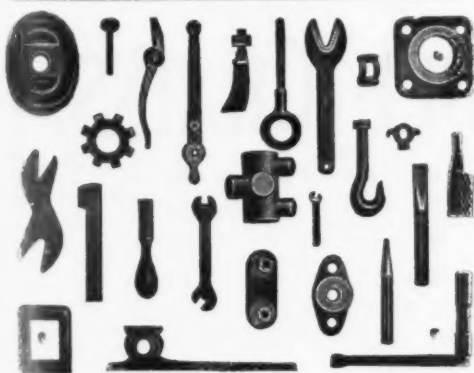


THE NAILS WE MAKE.

CB MAUD S. K AND HORSE-NAILS.

The tensile strength of the **K** Iron surpasses that of
any other material used for Horse-Nails.

PRICES
To Suit the Times
W.M. Mooney & Co.
Aurible Chasm, N. Y.



DROP FORGINGS

TO ORDER.

Send us Drawings or Samples
for Estimates on your
Requirements.

The TRANSUE & WILLIAMS CO.
ALLIANCE, OHIO.

Millett's Patent

Portable

CORE OVEN

All complete and ready to put the fire in.

No one who makes small cores
can afford to be without it.

DOUBLE DOORS.

One closing the oven when the other is open.

Saves Fuel, Saves Time.

Send for Circular.

MILLETT CORE OVEN CO., - Brightwood, Mass.

The ovens can be seen in the sample rooms of the S. Obermayer
Co., either in Cincinnati or Chicago, and in the show rooms of J. W.
Paxon & Co., Philadelphia.



BURDEN'S HORSE SHOES.

"Burden Best"

Iron

Boiler Rivets.

The Burden Iron Co.

TROY, N. Y.

PHOENIX HORSE SHOES,

PHOENIX HORSE SHOE CO.

Rolling Mills and Factories,
Poughkeepsie, N. Y.

Joliet, Ill.

P. F. BURKE,
Manufacturer of Patent Steel (Blunt and Sharp)



TOE-CALKS,

—ALSO—
BURKE'S IMPROVED
Horseshoers' Foot Vise

Send for circular

Dorr St., cor. D St.

SO. BOSTON,
MASS.



Die for Working
Sharp Calks.

HORSESHOE - H - CALKS (Neuse's Patent)

Always Sharp! No Slipping of the Horse!
No Injuries as caused by other Stud!
Great Saving of Horses and Horseshoes.

Price-List, with Testimonials, Post Free
Patentees and Sole Manufacturers.

LEONHARDT & CO.,
Berlin-Schöneberg, Germany



DROP FORGINGS.

THE M. SEWARD & SON CO.,
NEW HAVEN, CONN.

Estimates promptly furnished.



Ball Bearings
IN
Bicycles,
OLD.
Applied to
Tackle Blocks,
NEW.

The Cleveland Block Co.

CLEVELAND, OHIO,

will tell you all about them.



STAR



BRAND

**GIANT
CAR
STARTER**

SEND TO

**"The Largest
Block Factory in
the World"**

For their Catalogue and Prices.

BOSTON AND LOCKPORT BLOCK CO.,

Boston, Lockport, New York, U. S. A.

Cable Address, Blocks, Boston.

GENUINE MARTY TRAPS.

BURDITT & WILLIAMS, - BOSTON.



3 Sizes for Rats.

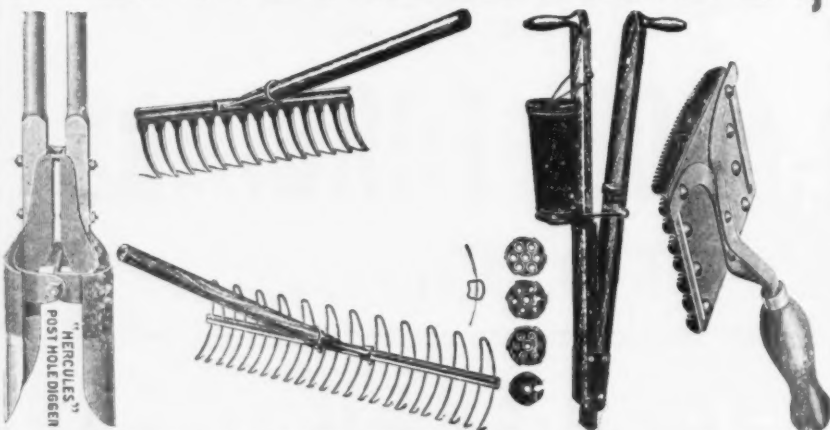
From 10 to 50 rats
capacity.

2 Sizes for Mice.

*We are sole agents and importers and furnish at the lowest prices in the market for traps that are really effective, though we do not undertake to compete with the flimsy imitations of the Marty Traps sold by the irresponsible "Dagos".

For sale by the leading hardware trade in the U. S., Canada, Honolulu, Porto Rico and the Philippines. Cuts furnished the trade for advertising purposes.

F. E. KOHLER & CO.,



**THE HARDWARE SPECIALTY MFRS.,
CANTON, OHIO, U. S. A.**

Established **FORGINGS,**

1864.



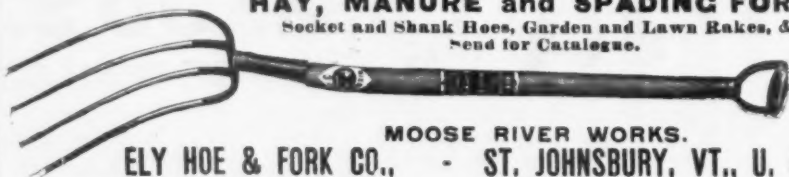
**CARRIAGE, BICYCLE,
AND SPECIAL.**

Correspondence Solicited.

THE E. D. CLAPP MANUFACTURING CO., - AUBURN, N. Y.

HAY, MANURE and SPADING FORKS,

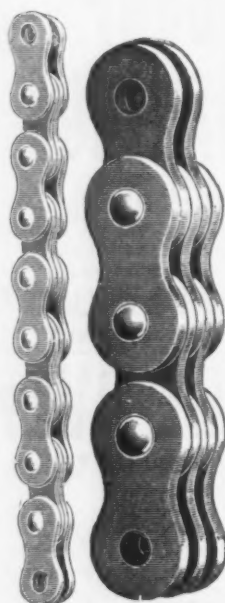
Socket and Shank Hoes, Garden and Lawn Rakes, &c.
Send for Catalogue.



MOOSE RIVER WORKS.

ELY HOE & FORK CO., - ST. JOHNSBURY, VT., U. S. A.

CABLE CHAINS.



No. 110 Copper for Sash of 400 lbs.

No. 10 " " " " 250 "

No. 30 " " " " 125 "

No. 40 " " " " 75 "

No. 6 Steel

No. 60 "

No. 55 "

Transom Chains,

Window Sash Pulleys,

Sash Fixtures.

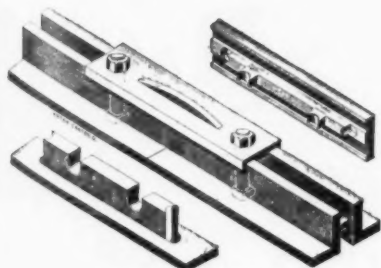
*Write for Catalogue of Hardware
Specialties.*

**The Smith & Egge Mfg. Co.,
BRIDGEPORT, CONN.**

No. 40. No. 6.
Actual Size

HAYING TOOLS AND HARDWARE SPECIALTIES.

Write for our CATALOGUE No. 17, just issued.



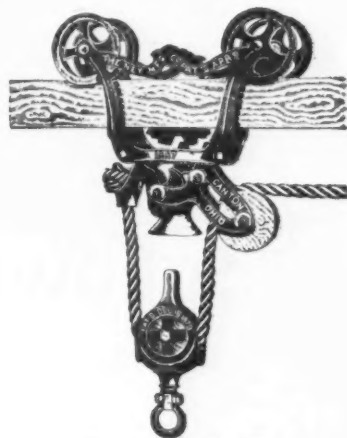
D. A. TRACK.



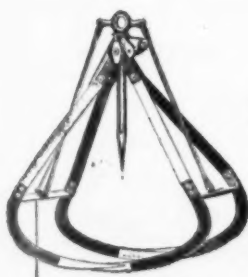
W. T. HANGING HOOK.



No. 5 CARRIER.



No. 20 CARRIER.

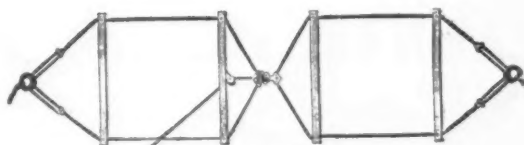


GRAB FORKS.

4 and 6 Tine.



SLING PULLEY.



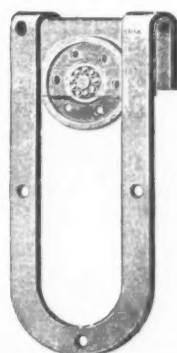
STANDARD SLINGS.



GENUINE NELLIS SING FORK.



CANTON WIRE STRETCHER.



ROLLER BEARING

Nos. 0, 1 and 2.



No 114 PULLEY.



STEEL RAFTER BRACKET



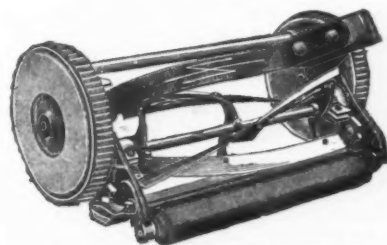
SWIV. ROPE HITCH.



HARRIS FORK



STEEL BARN DOOR TRACK.



NEW CANTON LAWN MOWER.

The Ney Mfg. Co., Canton, O.

Branch Houses
under our firm name: } Minneapolis, Minn.,
and Peoria, Ill., opened May 1st.

Our make of Lawn Mowers, both horse and hand power, have been adopted for EXCLUSIVE use season of 1900

on
PARIS
EXPOSITION
GROUNDS.



on
GREATER
NEW YORK
PARKS.

COLDWELL LAWN MOWER CO.,

WE MAKE ONLY HIGH GRADE GOODS.

SEND FOR OUR 1900 CATALOGUE, IT WILL INTEREST YOU.

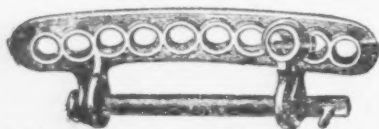
NEWBURGH,
N. Y.

LAWN ROLLERS



Made in two sizes, for either hand or horse. With or without weight boxes. Get catalogue and prices, 28 styles and sizes. Iron and Steel Land Rollers.

J. K. WILDER & SONS,
MONROE, MICH.



THE KRUSE KROSS KLEVIS CO.
Higginsville, Missouri.

THE KRUSE KROSS KLEVIS CO.
Higginsville, Missouri.

AMERICAN CORN AND FODDER SHOCK COMPRESSOR
Best Pulley HOLDS WHILE YOU TIE. Write for Price List.

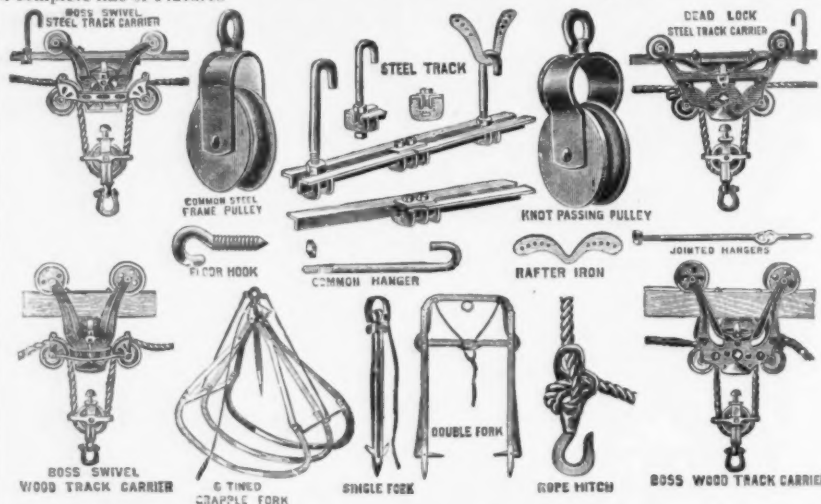


J. B. HUGHES, GREENSBURG, IND.

DEAD LOCK

Hay Carriers, Steel Track and the
Best Hay Slings Made.

Nine patterns of Steel and Wood Track Carriers. Three sizes of Slings. All styles of Forks, and a complete line of Fixtures



Write for Catalogue
and Lowest Prices.
Mention this paper.

JANESVILLE HAY TOOL CO.,
Janesville, Wisconsin.

To the RETAILER: If you cater to the best interests of your customers,

the consumers, your line of HAY KNIVES will consist only of the genuine "LIGHTNING," "BLIZZARD," or "THE MAINE." Adopt the suggestion as a fixed principle in your business and note the increase in sales, which is sure to follow. WHY? Why, because the buyer is sure to ask for our KNIVES, he knows no other, and will accept "something just-as-good" only under protest



To the JOBBER:

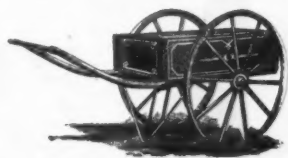
Don't try to give the RETAILER any other HAY KNIFE when he asks for the genuine "LIGHTNING," the "BLIZZARD," or "THE MAINE." If you do it certainly will react against you, and the next order which that retailer places will go to your competitor. Solemn FACTS. Think about it. Order thro' our Agents: WIEBUSCH & HILGER, Ltd., N. Y.

CLARK & PARSONS CO., E. Wilton, Me., Sole Mfrs.



We make these and everything in
TRUCKS, HAND CARTS, STEEL AND WOOD BARROWS,
COAL CARS, COAL DEALERS' SUPPLIES,
RUBBERED TRUCK WHEELS,
ROLLERS, &c., &c.

LANSING WHEELBARROW CO., Lansing, Mich.



BROWN'S

Patent
Roller
Bearing



AXLE.

SEND FOR CIRCULAR.

**SPECIALLY DESIGNED
FOR HEAVY WORK.**

Reduces Draft 30 to 50%.

Simple, Durable,
Guaranteed.

Manufactured Only By

CONCORD AXLE CO.,
Penacook, N. H. (U. S. A.).

HAVANA METAL WHEEL CO.,

MAKERS OF

Shovels, Scoops AND Spades.

NOT IN THE COMBINE.

GET OUR PRICES BEFORE YOU BUY.

HAVANA METAL WHEEL CO., - - Havana, Ills.

TUXEDO MOWERS

BEST HAND MOWERS MADE

Lightest
Running.



Does
Best
Work

THE FAIRBANKS COMPANY

Albany Boston? New York Philadelphia New Orleans
Baltimore Buffalo Pittsburgh Montreal
16 Great Eastern St., London, E.C.

NEW IDEAS.

THE AMERICAN HARDWARE
STORE illustrates and de-
scribes the best methods
that ingenuity and ex-
perience can devise for
Store Arrangement, Ac-
commodating Hardware,
Effective Display of Stock
and matters of vital im-
portance to dealers.

450 Pages.



500 Illustrations.

Three Dollars.

David Williams Company,

232-238 William Street,

New York.

A Barrow

of the "Columbus" type can be found the wide world over. That's because they meet the requirements as to durability, lightness and general excellence.

**OUR CATALOGUE IS FREE.
WANT ONE?**

The
**Kilbourne & Jacobs
Manufacturing Co.,
Columbus, O.**



Wheelbarrows, Scrapers and Trucks.

Being exclusive manufacturers of these goods we are in position to make the best and lowest prices, quality of production considered; would be pleased to enter into correspondence with those not already our customers upon the subject.

SIDNEY STEEL SCRAPER CO., 924 POPLAR ST.,
SIDNEY, O.

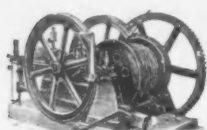


Shovels, Spades AND Forks.

OUR FORKS are made of the best crucible steel and handles of the best quality second growth white ash timber, put together in a workmanlike manner for service and looks.

Our Shovel Blades are of the best crucible steel, guaranteed equal to any on the market and superior to most; especially adapted for Railroads and Contractors. The handle of both these and the Ditching Spade in the first grade quality is from selected second growth close grained White Ash grown on high ground. Many makers use timber cut from swamp or low land growth, the grain of which is open and quality therefore inferior. Our Ditching Tools are of the best Steel, differing only in the various grades, made and shaped by the use of charcoal fires, giving them the peculiar temper and strength requisite in such tools; this, together with the shape and finish of these goods, enables us to give the consumer a tool that will do twice the work of an ordinary Drain, Post or Ditching Spade.

TERRE HAUTE SHOVEL AND TOOL CO.,
Terre Haute, Ind., U. S. A.
WRITE FOR CATALOGUE L.



THE WEBER HOISTING ENGINES are built to meet the demand from mine owners, quarrymen, ship and dock owners and others, for a strong, substantial and absolutely safe hoisting machine that would be more economical, more convenient and more reliable than the steam hoister of the past. They are meeting that demand everywhere. Send for catalog. **Weber Gas and Gasoline Engine Co.**, 485 S. W. Boulevard, Kansas City, Mo. Chicago Office: 1531 Monadnock Block

ESTABLISHED 1887
THE STORM MANUFACTURING CO
The Largest and Leading Makers of
Dumb-Waiters and Hand Elevators
NEW YORK OFFICE: 113 CHAMBERS ST. FACTORY & MAIN OFFICE: NEWARK, N. J.

BICYCLE REPAIRING.

A Manual Compiled from Articles in "The Iron Age."

By **S. D. V. BURR.**

208 pages, 205 illustrations, cloth, price, \$1.00

Sent, post-paid on receipt of price by
DAVID WILLIAMS COMPANY
232-238 William Street, New York.

WELDLESS STEEL RAKE.



JENKINS IRON & TOOL CO., MANUFACTURERS. Howard, Pa., U. S. A.



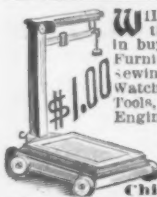
10,000 DEALERS WANTED

To Sell Our Barn Door Hangers Hay Carriers, Hay Slings, etc. THERE IS MONEY IN IT.

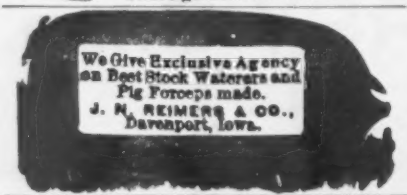
THE "LOUDEN GOODS" have no equal and are fast taking the place of everything else. Don't waste time on some thing out of date, but secure the sale of the goods that command the "cream of the trade" Address **LOUDEN MACHINERY CO., Box A, Fairfield, Iowa.**



PELOUZE SCALE & MFG CO.
CHICAGO, ILL. MANUFACTURERS OF
Scales
HOUSEHOLD COUNTER MARKET CANDY POSTAL SCALES SPRING BALANCES & ETC.



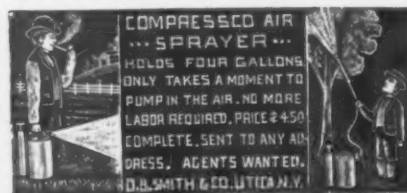
WILL go further with the C. S. Co. than with any other reliable firm in buying useful articles, including Furniture, Beds, Mattresses, Stoves, sewing Machines, Pianos, Organs, Watches, Bicycles, Safes, Blacksmiths' Tools, Mills, Lathes, Gasoline & Steam Engines, Plows, Scrapers, Carriages, Harness, Saddles, Wire Fencing and SCALES of all varieties. The Premium Wagon or Stock Scale, Steel Frames. Lists free. **Chicago Scale Co., CHICAGO, ILL.**



Mianus Elec. Co.
MIANUS, CONN.

BLAKE, LAMB CO.'S
Animal Traps.

SEND FOR CATALOGUE.
THE HAWKINS CO
Waterbury, Conn., U. S. A.



LIGHT CARS

—OF ALL KINDS—
FOR MINING, LOGGING, PLANTATION
CONTRACTORS & RAILWAY USE.
SHEFFIELD CAR CO.
OAK ST., THREE RIVERS, MICH.



Solid Steel Tray WHEELBARROWS

OF ALL KINDS.

Manufactured by
The American Steel Scraper Co.,
SIDNEY, OHIO, U. S. A.

Write for prices

FOR 1900.

We have the Largest and Best Line of Lawn Sprinklers, Spray Nozzles, Hose Pipe and Couplings made.



JAPANESE No. 12 ADJUST.

Our Sprinklers are Established and adopted by the Leading Parks in this country and abroad. Our Spray Nozzle is second to none. Our 3/4-inch Iron Plated Coupling is our Original and cannot be Duplicated.

SEND FOR OUR CATALOGUE AND DISCOUNT SHEET.

PLEUGER & HENGER MFG. CO.
ST. LOUIS, MO.

ALPHABETICAL LIST OF ADVERTISERS

A	Bommer Bros.	188	Cleveland Twist Drill Co.	64	Estes, G. L.	88	Hietz, T. & Son	8	
Acme Machinery Co.	66	Booth, The Lloyd Co.	84	Clinton Wire Cloth Co.	14	Estey Wire Works Co.	7	Hill, Henry F.	104
Acme Malleable Iron Works.	58	Borgner, Cyrus.	38	Cobb & Drew.	17	Etting, Edw. J.	84	Hill, N. N. Brass Co.	166
Acme Sheet Co.	125	Boss Washing Machine Co.	156	Coburn Trolley Track Mfg.	17	Euclid, L. A. Stamp Wks.	153	Hill, Clarke & Co.	98
Adam, W. J.	11	Boston Belting Co.	54	Cochran	140	Eureka Co.	156	Hill Dryer Co.	187
Adams Co.	78	Boston Blower Co.	81	Coaling Mfg. Co.	87	Evans, G. F.	82	Hilles & Jones Co.	77
Advance Machine Works.	86	Boston Bridge Works.	21	Coes Wrench Co.	150	Everson, B. M.	109	Hillman, J. H. & Son.	107
Affleck, Geo. E.	107	Boston Gear Works.	58	Coldwell Lawn Mower Co.	174	Excelator Needle Co.	188	Hine-Watt Mfg. Co.	165
Aiken, Henry	42	Boston & Lockport Block Co.	172	Coleman Hardware Co.	164	Exeter Machine Works.	76	Hitner, H. A. Sons.	108
Alas Mfg. Co.	63	Rotter, C.	111	Columbus Forge & Iron Co.	143			Hobart Electric Co.	45
Albany Foundry Co.	40	Bowen Mfg. Co.	72	Columbus Wire & Iron Wks.	8			Hobson, Houghton & Co.	30
Alexander Bros.	53	Rox, Alfred & Co.	52	Columbus Wire & Iron Wks.	8			Hoefler Mfg. Co.	73
Alhappa Steel Co.	25	Bradford Mach. & Mfg. Co.	16	Concord Axle Co.	175			Hofeller, Theo. & Co.	119
Alchbury Machine Co.	59	Bradlee & Co.	29	Conn. Valley Mfg. Co.	121			Hoffman, C. & A.	129
Allen, E. R.	37	Bradley Co.	83	Consolidated Iron & Steel Co.	25			Hoffman, Geo. W.	180
Allen, D. H. & Co.	143	Braceburn Steel Co.	38	Consolidated Italy's Electric				Hoggson & Pettis Mfg. Co.	131
Allentown Rolling Mills.	88	Brammer, H. F. Mfg. Co.	160	Lighting & Equipment Co.	89			Hollands Mfg. Co.	158
Alles, E. F. Co.	47	Braunsdorf-Mueller Co.	122	Cook, A. D.	51			Hollinger Fence Co.	8
American Appraisal Co.	118	Bridgeport Brass Co.	2	Cook, H. C. & Co.	119			Hoover & Gamble Co.	76
American Bicycle Co.	82	Bridgeport Chain Co.	189	Cook, T. W. G.	78			Horsburgh & Scott.	69
American Bicycle Co.	113	Bridgeport Deoxidized Bronze		Cook, Asa S. & Co.	77			Horton, E. & Son Co.	69
American Blower Co.	76	& Metal Co.	2	Cornell, J. B. & J. M.	98			Horton Mfg. Co.	161
American Carburetor Co.	37	Bridgeport Gun Implement		Coshocton Rolling Mill Co.	25			Hough Cash Recorder Co.	124
American Emery Wheel Wks.	63	Co.	163	Cotton, Barclay W. & Co.	34			Houghton & Buxton Mfg. Co.	117
American Hardware Mfg. Co.	117	Bridgeport Mfg. Co.	123	Covert Mfg. Co.	177			Houston, C. B. & Co.	32
American Iron & Steel Mfg.		Bridgeport Safety Emery		Covert's Saddlery Works.	119			Howard Iron Works.	132
Co.	28	Wheel Co.	60	Cox, Justice, Jr. & Co., Ltd.	32			Howard & Morse.	7
American Machinery Co.	18	Briggs, Marvin.	105	Cramp, Wm. & Sons S. & E. B.				Howes, S. M. Co.	129
American Mfg. Co.	64	Brilliant Gas Lamp Co.	145	Crane, W. M. Co.	35			Howson & Howson.	7
American Metal Co.	3	Bristol Co.	109	Creditors' Legal Union.	109			Hubbell, Harvey.	16
American Nickeloid Co.	4	Britton & Britton.	118	Crescent Brass & Iron Co.	121			Huber, S. V. & Co.	42
American Pig Iron Storage		Broderick & Bascom Rope Co.	7	Crescent Phosphorized Metal				Hudson Parer Co.	159
Warrant Co.	31	Brohard Co.	160	Co.	3			Hughes, J. B.	174
American Pulley Co.	54	Brooks, M. S. & Sons.	5	Crescent Steel Co.	81			Humphreys Mfg. Co.	130
American Railway Supply Co.	117	Brown & Co., Inc.	119	Cresson, Geo. V. Co.	52			Hungerford, U. T. Brass &	
American Screw Co.	137	Brown, E. E. & Co.	162	Crosby Steam Gage & Valve				Copper Co.	3
American Shearer Mfg. Co.	136	Brown Hoisting & Conveying		Co.	49			Hunt, C. W. Co.	8
American Sheet Steel Co.	124	Mch. Co.	57	Cross & Speirs Machine Co.	63			Harbur Rogers Mach. Co.	78
American Steel Hoop Co.	28	Brown, H. H. & Co.	120	Cunliffe, H. M.	111				
American Steel Scraper Co.		Brown & Sharpe Mfg. Co.	103	Curtis & Curtis.	70				
	117&178	Bryan Mfg. Co.	177	Cushman Chuck Co.	71				
American Steel & Wire Co.	10	Buck Bros.	125	Cutler-Hammer Mfg. Co.	56				
American Tin Plate Co.	24	Buck, Chas.	125						
American Tool Chest Co.	125	Buffalo Forge Co.	115&116&188	D					
American Tool Works Co.	82	Buffalo Specialty Mfg. Co.	132	Dahlmer Mfg. Co.	45				
Ames Sword Co.	58	Buhl Malleable Co.	40	Dalzell, Thos. H. & Co.	81				
Ansonia Brass & Copper Co.	2	Bullard Mch. Tool Co.	88	Dame, Stoddard & Co.	166				
Arden & W. R. Co.	152	Bulman, F. H. & Co.	65	Danielson Mch. & Tool Co.	105				
Arden Malleable Iron Co.	57	Bundy, Frank E. Lamp Co.	167	D'Amond & Littlefield Mch. Co.	70				
Arden Mfg. Co.	159	Burden Iron Co.	171	Dangler Store & Mfg. Co.	153				
Armstrong Mfg. Co.	68	Burditt & Williams.	172	Danville Bessemer Co.	81				
Ashtand Steel Co.	26	Burke, P. F.	171	Darby, Edw. & Sons.	14				
Ashtand Valve Co.	46	Burnham, Geo. Co.	76	Dart, E. M. Mfg. Co.	48				
Ashtand Mfg. Co.	151	Burton, Matthew.	16	Davis, W. P. Machine Co.	77				
Ashtand Pump Co.	181	Butterfield & Co.	71	Davis & Buxton Stamping Co.	166				
Atkins, C. B.	123	Byram & Co.	43	Davol, John & Sons.	2				
Atkins, E. C. & Co.	122			Dawson, A. L. & Co.	107				
Atlas Bolt & Screw Co.	121			Dayton Grass Catcher Co.	156				
Atlas Mfg. Co.	121			DeFrance Mch. Wks.	98				
Atwater Mfg. Co.	149			DeKalb Fence Co.	13				
Aurora Tool Works.	78			Deming Co.	138				
Automatic Machine Co.	60			Denman & Davis.	80				
Avery Stamping Co.	117&127			Detrick & Harvey Machine Co.	74				
B					74&107				
Babcock & Wilcox Co.	50			Diamond Drill & Mch. Co.	35				
Bader, Adamson & Co.	120			Diamond Machine Co.	63				
Baird, C. R. & Co.	33			Diamond Tack & Nail Wks.	15				
Baker & Co.	75			Dickinson, T. L.	60				
Baker Bros.	75			Dienelt & Eisenhardt.	71				
Baker, Jas. H. Mfg. Co.	40			Dillon-Grady Wire Co.	11				
Ball Bearing Co.	5			Dimmick, J. K. & Co.	34				
Baltimore Emanuel Co.	5			Disston, Henry & Son.	121				
Bardley, Jos.	135			Divine Bros.	60				
Barker & Chard Mch. Tool Co.	79			Dixon, Jos. Gracile Co.	106				
Barnes, Wallace Co.	5			Doan, J. B. & Co.	106				
Barnes, W. F. Co.	98			Dodge Machine Screw Co.	127				
Barnes, W. F. & John Co.	120			Dodge Mfg. Co.	35				
Barnes Mfg. Co.	120			Dodge Mfg. Co.	63				
Barnett, G. H. & Co.	153			Donaldson & Newton.	111				
Barnett & Reed Mfg. Co.	162			Draught Acetylene Apparatus	121				
Barnum, E. T.	12			Draught Machine Tool Co.	101				
Barnett, W. L.	132			Dresses, Muehl & Co.	88				
Bates Machine Co.	82			Drouve, G. Co.	115				
Bausch & Harris Mch. Tool Co.	101			Dubaque Machine Concern.	73				
Bayley, Wm. & Sons Co.	86			Dudgson, Richard.	42				
Beauregard & Co.	77			Dull Patent Co.	6				
Becker & Brainard Milling				Dunbar Bros.	18				
Mch. Co.	92			Dunham Nut Co.	18				
Beck, Novelty Co.	159			Dunn, Jas. P.	57				
Belden Machine Co.	119			Dupont Mfg. Co.	64				
Bellamy Stamping Co.	158			Durant, W. N.	79				
Bell, Edwin & Sons Co.	16			Dwiggins Wire Fence Co.	11				
Bellmont Iron Works.	111			E					
Bement, Miles & Co.	75			Eagle Anvil Works.	147				
Bemis & Call Hardware & Tool				Eastern Forge Co.	77				
Benbow Mfg. Co.	147			Eastern Machinery Co.	54				
Berg Bros. Co.	121			Easy Spring Hinge Co.	153				
Berlin Iron Bridge Co.	9			Eckels, Richard.	107				
Bertsch & Co.	82			Edwards Bicycle Co.	57				
Bess, L. H. & Co.	182			Edwards Electric Mfg. Co.	44				
Bess, L. H. & Co.	182			Edwards Mfg. Co.	151				
Bessmer Coke Co.	71			Elmer & Amend.	36				
Bingham & Fyfe & Mch. Co.	77			Elmer Electric Controller & Supply	51				
Birmingham Steel Co.	31			Ellis & Waltenberger.	51				
Birmingham Mfg. Co.	164			Ellis Hock & Fork Co.	172				
Birmingham Drill & Tool Co.	84			Empire Pipe Bending & Sup-	170				
Birmingham Hardware Co.	75			Energy Mfg. Co.	170				
Birmingham Step Ladder Co.	146			Ensign, Rickford & Co.	146				
Birmingham J. F.	121			Enterprise Foundry Co.	165				
Birmingham & Keeler Mfg. Co.	68			Enterprise Mfg. Co. of Pa.	157				
Birmingham & Spencer Co.	139			Erie & Schenck.	48				
Birmingham, Geo. H. & Co.	114			Erie Specialty Co.	168				
Birmingham, B. & Co.	111			Erikson, Edw. E.	42				
Birmingham & King.	4								
Birmingham, G. G., Sons & Co.	49								
Birmingham, Red F. & Co.	11								
Birmingham, M. J. & M. Co.	11								
Birmingham, J. & Co.	17								
Birmingham, E. W.	99								
Birmingham, R. Mfg. Co.	129								
Birmingham, Hermann & Co.	80								
Birmingham, Ross & Co.	94								
Bommer Bros.	188								
Booth, The Lloyd Co.	84								
Borgner, Cyrus.	38								
Boss Washing Machine Co.	156								
Boston Belting Co.	54								
Boston Blower Co.	81								
Boston Bridge Works.	21								
Boston Gear Works.	58								
Boston & Lockport Block Co.	172								
Rotter, C.	111								
Bowen Mfg. Co.	72								
Rox, Alfred & Co.	52								
Bradford Mach. & Mfg. Co.	16								
Bradlee & Co.	29								
Bradley Co.	83								
Braceburn Steel Co.	38								
Brammer, H. F. Mfg. Co.	160								
Braunsdorf-Mueller Co.	122								
Bridgeport Brass Co.	2								
Bridgeport Chain Co.	189								
Bridgeport Deoxidized Bronze									

Laughlin, Alex. & Co.	42
Law, Ernest & Co.	82
Lawrence Bros.	162
Lawson Mfg. Co.	163
Lea, J. Tattall & Co.	32
LeCount, Wm. G.	154
Leffel, James & Co.	46
Leffer, Chas. & Co.	77
Lehr's, Jno. S., Son & Co.	158
Leonard, John & Co.	111
Leonhardt & Co.	171
Leichen, A. & Sons Rope Co.	7
Levia, Henry & Co.	34
Lewis Tool Co.	153
Lidgerwood Mfg. Co.	188
Lillenberg, N.	20
Litma Steel Castings Co.	42
Lindsay, W. W. & Co.	26
Link-Belt Engineering Co.	57
Litchfield, J. M.	160
Littleford Bros.	122
Livermore, Homer F.	21&40
Lockhart Iron & Steel Co.	30
Lodge & Shipley Mch. Tool Co.	87&104
Logan Iron & Steel Co.	111
Logan & Strobbridge Iron Co.	134
Longnecker, G. A.	118
Lorain Foundry Co.	34
Lorain Steel Co.	31
Louden Mch. Co.	178
Loyd, John.	123
Lucas & Glenn.	85
Ludlow-Saylor Wire Co.	8
Lufkin Rule Co.	125
Lukens Iron & Steel Co.	29
Lunkenheimer Co.	48
Lyon, N.	161

M

McCabe, J. J.	81&104
McCabe Hanger Mfg. Co.	12&162
McCaffrey File Co.	152
McClure, G. W., Son & Co.	42
McCoy, Jos. F. Co.	54
McCullough Iron Co.	101
McDowell, Stocker & Co.	105
McFarland, Wm.	173
McGowan, J. H. & Co.	51
McInnes, C. E.	34
McKay, Jas. & Co.	32
McKinney Mfg. Co.	159
McKinnon Dash Co.	130
McLain, J. H. Co.	39
McNab & Harlin Mfg. Co.	46
Machinists' Supply Co.	103
Magnolia Metal Co.	1
Main Belting Co.	53
Maine Mfg. Co.	154
Mallin & Co.	59
Manning, Maxwell & Moore.	106
Manville Machine Co., E. J.	108
Markle Lead Works.	117
Marlin Fire Arms Co.	167
Marshall & Huchart Machy. Co.	105
Mason & Parker.	128
Mason Regulator Co.	47
Masssey Vise Co.	143
Matthiessen & Hogeler Zinc Co.	2
Mauls, Francis J.	117
Maurer, H. & Son.	38
May & Spalding.	111
Mayer, Maxwell M. Electric Co.	43
Mayhew, H. H. Co.	150
Maywood Fdry & Mch. Co.	114
Meades Cutting Facilities.	62
Merchant & Co.	8
Merkel, H.	144
Merrill Bros.	71
Merrill Bros. Co.	1
Messick C. S. & Co.	70
Mesta Machine Co.	34
Metropolitan Daylight Lamp Co.	152
Meyers, F. J. Mfg. Co.	122
Mianus Electric Co.	128
Michigan Wire Cloth Co.	15
Midleton & Co.	15
Mietz, Aug.	46
Milbradt, G. A. & Co.	146
Miles, F. S.	21
Miles, E. O. & Co.	111
Miller, C. & Son Co.	163
Miller, Edward & Co.	109
Miller, H. J.	17
Miller & Van Winkle.	158
Miller Engineering Co.	42
Millers Falls Co.	120&138
Millert Core Oven Co.	171
Milline, A. & Co.	32
Milton Mfg. Co.	18
Milwaukee Malleable & Grey Iron Works	83
Milwaukee Lick Co.	17
Miner & Peck Mfg. Co.	77
Mohr, J. J.	32
Monroe, S. G.	49
Monongahela Iron & Steel Co.	51
Mooney, W. M. & Co.	171
Moore, C. P.	146
Moore, Franklin Co.	17
Morgan Construction Co.	11
Morgan Spring Co.	65
Morgan & Wright.	124
Morley Bros.	119
Morrill, Chas.	40
Morris, P. Hollingsworth.	40
Morrison, Robert.	67
Morse Twist Drill & Mch. Co.	67
Morse, Williams & Co.	35
Morton, Thos.	164
Morton Mfg. Co.	87
Moseley Iron Bridge & Root Co.	30

Mossberg, Frank Co.	117
Mossberg & Granville Manufacturing Co.	101&105
Mugford, A.	121
Murdock Parlor Grate Co.	65
Myers, F. E. & Bro.	180
Myers, S. F. Co.	144

N

Nanz, C. & Co.	4
Narragansett Mch. Co.	153
Nash, Geo. & Co.	32
National Cutlery Co.	124
National Elastic Nut Co.	19
National Horse Nail Co.	171
National Machinery Co.	65
National Pipe Bending Co.	49
National Saw Co.	122
National Sewing Machine Co.	154
National Specialty Mfg. Co.	159
National Steel Co.	29
National Tube Co.	22
National Wire Corp.	15
Naugatuck Mfg. Co.	44
Nazel & Bassett.	60
Ness, Geo. M., Jr.	153
New Castle Shovel Co.	168
New Century Mfg. Co.	120
New Doty Mfg. Co.	86
New England Specialty Co.	129
New England Steel Casting Co.	83
New England Structural Co.	21
Newhall, Henry B.	12
New Haven Mfg. Co.	79
New Haven Wire Mfg. Co.	5
N. J. Iron & Metal Co.	111
N. J. Wire Cloth Co.	14
Newkirk, J. B. & Co.	32
Newport News Shipbuilding & Dry Dock Co.	47
New Process Twist Drill Co.	65
N. Y. A. T. Compressor Co.	51
N. Y. Blower Co.	76
N. Y. Machinery Depot.	104
N. Y. Stamping Co.	132
Ney Mfg. Co.	173
Niagara Machine & Tool Works	83
Nicholson File Co.	151
Nicol & Co.	124
Nicoll, B. & Co.	110
Niles Tool Works Co.	90&105
Nilson, A. H. Mch. Co.	84
Noite Brass Co.	46
North American Metalline Co.	8
North Bros. Mfg. Co.	135
Northampton Emery Wheel Co.	60
Northern Engineering Works	88
Northfield Knife Co.	129
Norton Emery Wheel Co.	61
Norton Mfg. Co.	131
Norton, W. D.	109
Norwalk Iron Works Co.	51
Norwalk Lock Co.	163
Norwood Bicycle Co.	75
Nut & Washer Mfg. Co.	12
Nuttall, R. D. Co.	84

O

Obermayer, S. Co.	35
Oeltinger, J. L.	160
Ogden & Wallace.	33
Onida Community.	126
Orangeville Agr'l Works & Fdy. Co.	146
Ormsby, E. A.	6
Osborn Mfg. Co.	134
Osawan Mills Co.	157
Oster Mfg. Co.	17
Ostrander Fire Brick Co.	38
Ostrander, W. R. & Co.	146
Otis Steel Co.	33

P

Palmer, I. E.	167
Palmer Hardware Mfg. Co.	165
Paradox Machinery Co.	105
Parker, Chas. Co.	134
Parkhurst, L. D.	144
Passale Rolling Mill Co.	23
Pat. H. F. H. Mfg. Co.	74
Patterson, F. L.	106
Pawling & Harnischfeger.	53
Paxson, J. W. Co.	36
Peck, Stow & Wilcox Co.	135
Peck & Ayer Co.	45
Peerless Rubber Mfg. Co.	54
Pelouze Scale & Mfg. Co.	178
Penn. Metal Ceiling & Roofing Co.	121
Pennsylvania Engineering Wk.	41
Pennsylvania Machinery Co.	105
Peony vania Smelting Co.	27
Perkins, B. F. & Son.	76
Perkins, Henry.	19
Perry, F. H. & Co.	129
Perry, Wm. H. Co.	111
Peters Cartridge Co.	169
Phenix Mfg. Co.	165
Phenix Tube Co.	40
Phila. Machine Screw Works.	19
Phila. Machine Tool Co.	76
Phila. Pneumatic Tool Co.	28
Phila. Roll & Machine Co.	83
Phillips F. R. & Sons Co.	27&111

Phillips, E. & Sons.	15
Phoenix Foundry.	39
Phoenix Horseshoe Co.	171
Phoenix Iron Co.	29
Phosphor Bronze Smelting Co.	8
Plerson & Co.	25
Pike Mfg. Co.	148
Pilling & Crane.	1
Pine Iron Works Co.	29
Pittkin, A. B. Machinery Co.	106
Pittsburgh Mfg. Co.	65
Pittsburgh Reduction Co.	118
Pittsburgh Screw & Bolt Co.	17
Pittsburgh Shear, Knife & Machine Co.	39
Pittsburgh Steel Shaffing Co.	28
Plueger & Henger Mfg. Co.	173
Plume & Atwood Mfg. Co.	2
Plymouth Mills.	16
Pneumatic Crane Co.	69
Poole, W. B. Co.	46
Pollock, Robt. & Son Co.	50
Pope Sales Department.	166
Port Chester Bolt & Nut Co.	20
Porter, H. K.	21
Portland Ladder Co.	146
Potter & Johnson Co.	90
Potts, Horace T. & Co.	32
Poulter & Co.	104
Pratt Chuck Co.	69
Pratt & Whitney Co.	84
Prentiss Bros. Co.	102
Prentiss, Geo. W. & Co.	15
Prentiss Tool & Supply Co.	106
Presley Vise Co.	153
Presley Fire Brick Co.	38
Pridmore, Henry E.	39
Pugh, Job T.	125
Pullman, J. Wesley.	32
Pullman Sash Balance Co.	164
Putnam Nail Co.	170

Q

Q & C Co.	118
Quincy Valve & Mfg. Co.	43
Quint, A. D.	88

Rand Drill Co.	50
Randolph-Cloves Co.	2
Randolph Iron Co.	57
Rawson Electric Co.	177
Reade & Bowler.	87
Reading Crane & Hoist Works	58
Reading Foundry Co.	20
Reading Hardware Co.	121
Reading Screw Co.	7
Red Jacket Mfg. Co.	130
Reece, E. F. Co.	71
Reeves, Paul S.	183
Reimers, J. N. & Co.	178
Reliance Mch. & Tool Co.	64
Remington Arms Co.	168
Republic Iron & Steel Co.	1&187
R. I. Perkins Horse Shoe Co.	171
Rhode Island Tool Co.	18
Rhodes Mfg. Co.	62
Ridgway, Craig & Son Co.	55
Ripley & Bartlett.	17
Ritter-Conley Mfg. Co.	17
Roberts, A. & P. Co.	30
Rockford Bolt Works.	18
Rockwell Engineering Co.	42
Rogers, M. H.	111
Rogers, W. M. Boat, Gauge & Drill Wks.	86
Rome Mfg. Co.	129
Ross, J. J. J.	103
Rossiter, McGovern & Co.	105
Rosland, William & Harvey.	73
Roydson Fdry & Mch. Co.	188
Rudolph & Krummel.	18
Rug, P. J. W. Mfg. Co.	46
Russell & Erwin Mfg. Co.	136
Rutter, A. T. Tring Co.	2
Ryan, J. J. & Co.	2

S

Sabin Machine Co.	5
Safety Emery Wheel Co.	62
Saginaw Mfg. Co.	52
St. John Spring Co.	5
St. Joseph Pump & Mfg. Co.	160
St. Louis Electrotype Foundry	117
St. Louis Shovel Co.	55
Samson Cordage Works.	1
Samuel, Frank.	2
Samuel, M. & Sons.	131
Sandwich Enterprise Co.	71
Sanderson Sons, D.	120
Sawyer Tool Co.	120
Scaife, Wm. B. & Sons.	20
Scheeler's Sons.	8
Schneider & Treunkamp Co.	161
Schneider, M. Sons & Co.	125
Schwerdt & Siebert.	19
Scott, Chas. Spring Co.	16
Scott, Geo. M.	58
Seavay Mfg. Co.	154
Seldel & Hastings Co.	74
Sellers, Wm. & Co.	80
Senneca Falls Mfg. Co.	80
Sennett, Geo. R. Co.	47
Sessions Foundry Co.	87
Seward, M. & Son Co.	171
Seibert's Sons, L. F.	104
Sheffield Car Co.	178
Shelby & Co.	113
Shelby Steel Tube Co.	91

Shelton Co.	17
Shiffner Bridge Co.	20
Shimer, H. M. & Co.	4
Shonberg, I.	4
Shultz Belting Co.	1
Shuster, F. B. Co.	74
Sibley & Ware.	73
Sidney Steel Scraper Co.	176
Sigourney Tool Co.	73
Silk, Anderson Co.	78
Silliman, Fred'k W.	131
Silver Lake Co.	164
Silver Mfg. Co.	74
Simonds Mfg. Co.	122
Simplex Time Recorder Co.	127
Singer, Nimick & Co.	31
Skinner Chuck Works.	68
Slate, Dwight Mch. Co.	78
Slocumb, J. T. & Co.	152
Sloss Sheffield Steel & Iron Co.	25
Smith & Egge Mfg. Co.	172
Smith, D. B. & Co.	178
Smith, M. B. Co.	111
Smooth On Mfg. Co.	79
Smythe, S. R. Co., Inc.	42
Snell Mfg. Co.	132
Snow, L. T.	187
Snyder, W. P. & Co.	30
Sommer's Son, John.	188
Southern Railway Co.	109
Southward Fdry. & Mch. Co.	47
Speldel, J. G.	52
Spencer's, I. S. Sons.	38
Spencer Automatic Mch. Screw Co.	188
Spooford, W. S. & Son.	38
Springfield Drop Forging Co.	166
Springfield Mch. Screw Co.	143
Springfield Mfg. Co.	63
Standard Caster & Wheel Co.	141
Standard Chain Co.	134
Standard Co.	154
Standard Fdry. & Mfg. Co.	38
Standard Pneumatic Tool Co.	96
Standard Scale & Supply Co.	78
Standard Tool Co.	64
Standard Varnish Works.	154
Stanley, G. W. Co.	12
Stanley Rule & Level Co.	134
Stanley Works.	162
Star Corundum Wheel Co.	62
Star Heel Plate Co.	153
Star Mfg. Co.	152
Starr Bros. B. Co.	149
Starrett, L. S. Co.	149
Staten Island Clay Co.	83
Stetler-Bischoff Co.	27
Steel Rail Supply Co.	111
Sterling Emery Wheel Mfg. Co.	62
Stewart, J. A. & Son, Tool Co.	110
Stewart, J. M. Mfg. Co.	149
Steward & Romane Mfg. Co., Ltd.	19
Stewart Electrical Co.	108
Stewart Iron Works.	8
Stewart Wire Co.	7
Stocker, E. B. & Co.	7
Stokes Bros. Mfg. Co.	152
Storm Mfg. Co.	178
Stover Mfg. Co.	143
Stow Flexible Shaft Co.	66
Stow Mfg. Co.	66
Stow Mfg. & Fdry. Co.	161
Stratton, E. B. & Co.	157
Stribley & Foote Co.	146
Stroud, E. H. & Co.	34
Sturtevant, B. F. Co.	102
Superior Charcoal Iron Co.	83
Supple Hardware Co.	124
Swedish Razor Co.	124
Sweetzer, W. A.	7
Swindell, W. & Bros.	39
Syracuse Chilled Plow Co.	177

T

Tabor Mfg. Co.	47
Talbot Mfg. Co.	149
Talbot, W. O.	33
Tanite Co.	188
Tappin Mfg. Co.	153
Tatum, Sam'l. Co.	158
Taunton Locomotive Mfg. Co.	45
Tausig, N. W. & Co.	39
Taylor's, Chas. & Co.	153
Tennessee Coal, Iron & R. R. Co.	28
Terre Haute Shovel & Tool Co.	178
Thew Auto. Shovel Co.	178
Thomas & Lowe Machinery Co.	106
Thomas, Theodore.	117
Thompson, Hugh L.	76
Thomson, W. H. & Co.	32
Thomson Bros. Co.	126
Tidewater Steel Co.	26
Tiebout, W. & J.	146
Tilghner, E. H. & Co.	47
Titusville Forge Co.	47
Tod, Wm. & Co.	47
Toler, Jno. Sons & Co.	100
Toomey, Frank.	104
Totten & Hogg Iron & Steel Fdy. Co.	35
Tower & Lyon.	142
Townsend, C. C. & E. P.	18
Transue & Williams Co.	171
Trenton Iron Co.	41
Tretlow, Sam'l. & Co. Ltd.	81
Trinity Mfg. Co.	153
Troy Nickel Works.	159
Truse-At Boat Mfg. Co.	48
Tucker & Dorsey Mfg. Co.	141
Turner, Vaughn & Taylor Co.	11
Tyler, W. S. Co.	118

U

Udell Works.	143
Uehling, Steinbart & Co. Ltd.	33
Union Hardware Co.	142
Union Mfg. Co.	164
Union Mfg. Co.	164
Union Metallic Cartridge Co.	1

Union Steel Casting	30
United Metals Selling Co.	30
U. S. Cast Iron Pipe & Foundry Co.	30
U. S. Clothes Pin Co.	30
U. S. Electro Galvanizing Co.	30
U. S. Steel Lock Co.	30
U. S. Wire Mat Co.	30
Universal Machine Co.	30
Up-to-date Mfg. Co.	30
Utica Drop Forge & Tool Co.	30

V

Valentine, M. D. & Co.	30
Van Dorn Iron Works	30
Van Wagoner & Williams	30
Hardware Co.	30
Variety Machine Co.	30
Velox Machine Works	30
Virginia Iron Coal & Coke Co.	30
Vitrified Emery Wheel Co.	30
Vulcan Iron Works	30

CLASSIFIED LIST OF ADVERTISERS.

Advertisement Writer

Manly, Francis L., Phila., Pa.

Agricultural Implements

John A. Farming Tool Co., Ft. Madison, Ia.

Whitcomb & Cooley Mfg. Co., Jackson, Mich.

Air Compressors

Baird, L. Machinery Co., Pittsburgh, Pa.

Castro Air Compressor Works, 36 Cortlandt St., New York.

Ingalls-Sergeant Drill Co., 28 Cortlandt St., N. Y.

N. Y. Air Compressor Co., 130 Liberty St., N. Y.

Norwalk Iron Works, S. Norwalk, Ct.

Pedrick & Ayer Co., Philadelphia, Pa.

Rand Drill Co., 100 Broadway, N. Y.

Air Pumps

Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.

Air Moving Machinery

Howard & Morse, 45 Fulton St., N. Y.

Alarm Tills

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Alloys

Blackall, Geo. G., Sons & Co., Ltd., Liverpool, England.

Aluminum

Janney, Steinmetz & Co., Phila., Pa.

Pittsburgh Reduction Co., Pittsburgh, Pa.

Aluminum, Brass and Bronze

Howard & Morse, 45 Fulton St., N. Y.

Ammunition

Peters Cartridge Co., Cincinnati, O.

Union Metallic Cartridge Co., 813-815 Broadway, N. Y.

Annealing Boxes

Warren City Boiler Wks., Warren, O.

Anti-Friction Metals—See Babbitt Metal.

Anti-Rust.

Hunt Chemical Co., Phila., Pa.

Anvils

Chicago House Wrecking Co., Chicago.

Columbus Forge & Iron Co., Columbus, O.

Eagle Anvil Works, Trenton, N. J.

Hay-Budden Mfg. Co., Brooklyn, N. Y.

Anvil and Vise (Combination)

Fulton Iron & Eng. Works, Detroit, Mich.

Apple Parers

Goodell Co., Antrim, N. H.

Hudson Parer Co., Leominster, Mass.

Appraisers

American Appraisal Co., Milwaukee, Wis.

Arc Lamps

General Electric Co., Schenectady, N. Y.

Auctioneers

Wassell, E. & Co., N. Y.

Auger Bits

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

Ford Bit Co., Holyoke, Mass.

Jennings, Russell Mfg. Co., Deep River, Conn.

Jennings, C. E. Co., 101 Reade St., N. Y.

Mayhew, H. H. Co., Shelburne Falls, Mass.

Pugh, Joe T., Phila., Pa.

Small Mfg. Co., Fitchburg, Mass.

Tower & Lyon, 91 Chambers St., N. Y.

Automatic Machines

Automatic Mch. Co., Bridgeport, Conn.

Manville, E. J. Mch. Co., Waterbury, Ct.

Nelson, A. H. Mch. Co., Bridgeport, Ct.

Spencer Automatic Mch. Screw Co., Hartford, Conn.

Automobiles

Amer. Blev. Co., Indianapolis, Ind.

Awning Hardware

Garland Chain Co., Rankin, Pa.

Awning Hooks

Wheeling Hinge Co., Wheeling, W. Va.

Axe Wedges

Woodruff, W. W. & Sons, Mt. Carmel, Ct.

Axles

Havana Metal Wheel Co., Havana, Ill.

Concord Axle Co., Penacook, N. H.

Babbitt Metal

Hertz, T. & Son, St. Louis, Mo.

Magnolia Metal Co., 263-267 West St., N. Y.

Markie Lead Works, St. Louis, Mo.

Merchant & Co., Inc., Philadelphia, Pa.

Reeves, Paul S., Philadelphia, Pa.

Thimer, H. M. & Co., Phila., Pa.

Shonberg, L., 172 Hudson St., N. Y.

Bale Ties

Grainoid Wire Co., Braddock, Pa.

Kilmer Wire Mfg. Co., Chicago, Ill.

Wilson, H. P. & H. F., 577-579 Tenth Ave., N. Y.

Ball Flouts

Naugatuck Mfg. Co., Naugatuck, Conn.

Cleveland Ball & Screw Co., Cleveland, Ohio.

Bank and Office Railing

Rey Wire Works Co., 65 Fulton St., N. Y.

Barb Wire and Fence

Dillon-Grissold Wire Co., Sterling, Ill.

Bar Iron

Abington Rolling Mill, Allentown, Pa.

American Iron & Steel Mfg. Co., Leavenworth, Kan.

American Steel Hoop Co., Pittsburgh, Pa.

Brown & Co., Inc., Pittsburgh, Pa.

Bruden Iron Co., Troy, N. Y.

Cheney Iron & Steel Co., Muskegon, Mich.

Consolidated Iron & Steel Co., Bristol, Pa.

Lockhart Iron & Steel Co., Pittsburgh, Pa.

Loren Iron & Steel Co., Burnham, Pa.

Monongahela Iron & Steel Co., Pittsburgh, Pa.

National Steel Co., Bridgeport, O.

Republic Iron & Steel Co., Chicago, Ill.

Tennessee Coal, Iron & R. E. Co., Birmingham, Ala.

Virginia Iron, Coal & Coke Co., Bristol, Va.

Barb Tub Seats

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

Bearings

Longearing Co., Boston, Mass.

Belters

Geo. M., Chicago, Ill.

Bells and Gongs

Revin Bros. Mfg. Co., East Hampton, Ill.

Hill, S. N. Brass Co., E. Hampton, Ct.

Miller, Edward & Co., Meriden, Ct.

Mossberg, Frank Co., Attleboro, Mass.

Star Bros. Bell Co., Easthampton, Ct.

Bell Dressing

Dixon, Jos., Crucible Co., Jersey City, N. J.

Bell Hooks

Bristol Co., Waterbury, Conn.

Clay Stamping Co., Cleveland, O.

Talcott, W. O. Providence, R. I.

Bell Lacing

Allen & Co., Cleveland, O.

Bell Studs

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Belting

Alexander Bros., 412 N. 2d, Phila., Pa.

Ance sword Co., Chicago, Mass.

Boston Belting Co., Boston, Mass.

Luhi Malleable Co., Detroit, Mich.

Jeffrey Mfg. Columbus, O.

Link-eit Engineering Co., Phila., Pa.

Machinists' Supply Co., Rochester, N. Y.

Main setting Co., Philadelphia, Pa.

Peerless Rubber Mfg. Co., 19 - arren St., New York.

Shultz Belting Co., St. Louis, Mo.

Bending Rails

Bertsch & Co., Cambridge City, Ind.

Hiller & Jones Co., Wilmington, Del.

New Dory Mfg. Co., Jamesville, Wis.

Niles Tool Works, Hamilton, O.

Bicycles

American Bicycle Co., Park Row Bldg., N. Y.

Eclectic Bicycle Co., Elmira, N. Y.

Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.

Pope Sales Department, Hartford, Ct.

Remington Arms Co., Ilion, N. Y.

Supple Hds. Co., 1 Hls., 14 Hls. & 2 Hls. Co., Chicago, Ill.

Bicycle Belts—See Belts and Gongs.

Bicycle Chains

Bridgeport Chain Co., Bridgeport, Ct.

Bicycle Lamps

Bridgeport Brass Co., Bridgeport, Conn.

Bundy, Frank E. Lamp Co., Elmira, N. Y.

Hill, S. N. Brass Co., E. Hampton, Ct.

Miller, Edward & Co., Meriden, Conn.

Plume & Atwood Mfg. Co., 29 Murray St., New York.

Bicycle Machinery

Bliss, E. W. Co., Brooklyn, N. Y.

Draper Mch. Tool Co., Worcester, Mass.

Garvin Mch. Co., Spring and Varick Sts., New York.

Pratt & Whitney Co., Hartford, Conn.

Rudolph & Grumme, Chicago, Ill.

Bicycle Parts

Davis, Buxton Stamping Co., Worcester, Mass.

Houghton & Buxton Mfg. Co., Worcester, Mass.

Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.

Springfield Machine Screw Co., Springfield, Mass.

Standard Tool Co., Cleveland, O.

Bicycle Pumps

Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.

Bicycle Spokes

Excelsior Needle Co., Torrington, Ct.

Bicycle Sundries

Revin Bros. Mfg. Co., E. Hampton, Mass.

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

Eclectic Bicycle Co., Elmira, N. Y.

Hill, S. N. Brass Co., E. Hampton, Ct.

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Miller, Edward & Co., Meriden, Conn.

Smith & Egge Mfg. Co., Bridgeport, Ct.

Supple Hds. Co., Phila., Pa.

Bicycle Wrenches

Springfield Drop Forging Co., Springfield, Mass.

Star Mfg. Co., Carpentersville, Ill.

Blender Twine

Blender Mfg. Co., 65 Wall St., N. Y.

Bird Cages

Hendryx, Andrew B. Co., New Haven, Conn.

Bits

Conn. Valley Mfg. Co., Centerbrook, Ct.

Orton Mfg. Co., Chester, Conn.

Perry, F. H. & Co., Chester, Conn.

Bit Braces

Mason & Parker, Winchendon, Mass.

Bits and Braces

Fray, Jno. S. & Co., Bridgeport, Conn.

Black Plates

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Blanch Forges

Miner & Peck Mfg. Co., New Haven, Ct.

Boston & Lockport Block Co., Boston.

Fulton Iron & Eng. Wks., Detroit, Mich.

Lane Bros. Co., Poughkeepsie, N. Y.

Union Hardware Co., Torrington, Ct.

Blowers

American Blower Co., Detroit, Mich.

Havley, Wm. & Sons Co., Milwaukee, Wis.

Boston Blower Co., Hyde Park, Mass.

Buffalo Forge Co., Buffalo, N. Y.

Champion Blower & Forge Co., Lancaster, Pa.

Cornell, J. B. & J. M., 26th St. and 11th Ave., New York City.

Exeter Machine Wks., Boston, Mass.

N. Y. Blower Co., Bucyrus, O.

Sturtevant, R. F. Co., Boston, Mass.

Wilbraham Baker Blower Co., Phila., Pa.

Best Hardware

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Boats

Daimler Mfg. Co., Long Island City, N. Y.

Boiler Makers' Machinery

Worcester, Mass.

Boiler Plates

Lukens Iron & Steel Co., Coatesville, Pa.

Seldel & Hastings Co., Wilmington, Del.

Boiler Tubes

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Boilers

National Tube Co., Pittsburgh, Pa.

Boilers, Steam

Babcock & Wilcox Co., 30 Cortlandt St.

Caball Sales Dept., Pittsburgh, Pa.

Harrison Safety Boiler Wks., Phila., Pa.

Leffel, James & Co., Springfield, O.

Pollock, W. R. Co., Youngstown, O.

Watson, E. P., Elizabeth, N. J.

Wetherill, Robert & Co., Chester, Pa.

Bolt Cutters

Chambers Bros., Philadelphia, Pa.

Helwig Mfg. Co., St. Paul, Minn.

Porter, H. B., Boston, Mass.

Sellers, Wm. & Co., Inc., Phila., Pa.

Bolt and Nut Machinery

Acme Machinery Co., Cleveland, Ohio.

Alax Mfg. Co., Cleveland, Ohio.

Detrick & Harvey Mch. Co., Baltimore, Md.

Howard Iron Works, Buffalo, N. Y.

National Machinery Co., Hlfn, Ohio.

Relevance Mch. & Tool Co., Cleveland, O.

Webster & Perks Tool Co., Springfield, Ohio.

Bolts

American Iron & Steel Mfg. Co., Leavenworth, Kan.

Archer & Sons Co., Providence, R. I.

Blake & Johnson, Waterbury, Conn.

Dunham Nut Co., Unionville, Conn.

Franklin-Moore Co., Winsted, Conn.

Hill's Sam'l Sons, 29 W. 10th St., N. Y.

Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

Ladd, W. C., Bristol, Conn.

National Elastic Nut Co., Milwaukee, Wis.

Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.

Chain
Bradlee & Co., Philadelphia.
Bridgeport Chain Co., Bridgeport, Ct.
Garland Chain Co., Rankin, Pa.
Hale Bros., Worcester, Mass.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Jenkins Iron & Tool Co., Howard, Pa.
Link-Belt Engineering Co., Phila., Pa.
McKay Jas. & Co., Pittsburgh, Pa.
Onella Community, Ltd., Niagara Falls
Standard Chain Co., Pittsburgh, Pa.

Chain Plants
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

Chain Sprocket
Hall Machine Co., Detroit, Mich.

Chemicals
Kaiser & Amend, New York.

Cherry Stoppers
Enterprise Mfg. Co., Philadelphia, Pa.
Goodell Co., Antrim, N. H.

Chisels
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
Jennings, C., 101 Reade St., N. Y.
White, L. & J. Co., Buffalo, N. Y.

Christmas Tree Holders
North Bros. Mfg. Co., Philadelphia, Pa.

Chucks
Cushman Chuck Co., Hartford, Conn.
Doehler Mfg. Co., Middletown, Conn.
Goodell Pratt Co., Greenfield, Mass.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Holland Mfg. Co., Erie, Pa.
Horton, E. & Son Co., Windsor Locks, Ct.
Ideal Machine Works, Hartford, Conn.
Pratt Chuck Co., Frankfort, N. Y.
Skinner Chuck Co., New Britain, Conn.
Standard Tool Co., Cleveland, O.
Union Mfg. Co., 101 Chambers, N. Y.
Whitton, D. E. Mach. Co., New London, Conn.

Churns
Asplund Mfr. Co., Jackson, Mich.

Circular Sawing Machines
Kiddier, R. E., Worcester, Mass.

Clamps
Besley, C. H. & Co., Chicago, Ill.
Hammer & Co., Branford, Conn.

Clevis
Krusse Kross Klevis Co., Higginsville, Mo.

Clipping Machines
Amer. Shearer Mfg. Co., Nashua, N. H.
Chicago Flexible Shaft Co., Chicago, Ill.
McGoy, Jos. F. Co., 36 Warren St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Clothes Bars
Udell Works, Indianapolis, Ind.

Clothes Dryers
Hill Dryer Co., Worcester, Mass.

Clothes Pins
S. S. Clothes Pin Co., Montpelier, Vt.

Coal
Sloss, Sheffield Steel & Iron Co., Birmingham, Ala.
Washington Coal & Coke Co., Dawson, Pa.
Wister, Francis, Philadelphia, Pa.

Coal Cars
Lansing Wheelbarrow Co., Lansing, Mich.

Coal Picks
Jen-tins Iron & Tool Co., Howard, Pa.

Coal Shutes
Lansing Wheelbarrow Co., Lansing, Mich.

Coasters
Eclipse Bicycle Co., Elmira, N. Y.

Coffee and Spice Mills
Arcade Mfg. Co., Freeport, Ill.
Parker, Chas. Co., Meriden, Conn.

Coke
Beasomer Coke Co., Pittsburgh, Pa.
Dimmick, J. K. & Co., Phila., Pa.
Frick, H. C. Coke Co., Pittsburgh, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Virginia Iron, Coal & Coke Co., Bristol, Va.
Washington Coal & Coke Co., Dawson, Pa.
Wister, Francis, Philadelphia, Pa.

Cold Saws
Lucas & Gilem, Philadelphia, Pa.
Q. & C. Co., Chicago, Ill.

Collectors
Creditors Legal Union, 802 Broadway, N. Y.

Compressed Air Machinery
Phila. Pneumatic Tool Co., Phila., Pa.

Compressors, Folder
Haines, J. B., Greensburg, Ind.

Conductor Pipe
Bergner Bros. Co., Philadelphia, Pa.

Conveying Machinery
Aultman Co., Canton, Ohio.
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
California Wire Works, San Francisco.
Hunt, C. W. Co., W. New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Cooking Utensils
Cleveland Stamping & Tool Co., Cleveland, O.

Copper
Hendricks Bros., 49 Cliff, N. Y.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
United Metals Selling Co., 11 Broadway, N. Y.

Copper Hammers
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Copper Rail Bands
American Steel & Wire Co., Chicago, Ill.

Copper Rivets and Bars
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Copper Tacks and Nails
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Copper Wire, Bare and Insulated
American Steel & Wire Co., Chicago, Ill.

Cordage
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

Cordage Machinery
Hoover & Gamble Co., Miamisburg, O.

Core Ovens
Yerkes & Miller Core Oven Co., Brightwood, Mass.

Cork Screws and Cork Pullers
Erie Specialty Co., Erie, Pa.

Corn Hooks
Withington & Cooley Mfg. Co., Jackson, Mich.

Corn Huskers
Wheeler Mfg. Co., Aurora, Ill.

Cornice Brakes
Brisch & Co., Cambridge City, Ind.

Corrugated Iron and Steel
Garrett Iron & Steel Rolling Co., Cleveland, O.
McNough Iron Co., Wilmington, Del.
Seafie, Wm. B. & Sons, Pittsburgh, Pa.

Cotton Ties
American Steel Hoop Co., Pittsburgh, Pa.

Counting Machines
Durant, W. N., Milwaukee, Wis.

Couplings, Compression
Senoff, Geo. B. Co., Youngstown, O.

Cow Ties
Garland Chain Co., Rankin, Pa.
Onella Community, Ltd., Niagara Falls, Pa.

Cranes
Brown Hoisting & Conveying Mch. Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland, Ohio.
Cleveland Crane & Car Co., Cleveland, O.
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger, Milwaukee, Wis.
Pneumatic Crane Co., Pittsburgh, Pa.
Reading Crane & Hoist Wks., Reading, Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.
Spindel, J. G., Reading, Pa.
Whitney Foundry Equipment Co., Harvey, Ill.

Crank Handles
Northwood Bicycle Co., Cincinnati, O.

Crayon
St. Ward, D. M. Mfg. Co., Chattanooga, Tenn.

Crucibles
Dixon, Jos. Crucible Co., Jersey City, N. J.

Cannolas
Paxson, J. W. Co., Philadelphia, Pa.
Whitney Foundry Equipment Co., Harvey, Ill.

Cupolas, Hot Blast
Bryan & Co., Detroit, Mich.

Curry Combs
New York Stamping Co., Brooklyn, N. Y.

Cutlery
Cattaraugus Cutlery Co., Little Valley, N. Y.
Chaffin, John & Sons, 85 to 89 Cliff St., N. Y.
Dame, Stoddard & Co., Boston.
Goodell Co., Antrim, N. H.
Kimball, C. J. Co., Bannington, N. H.
Northfield Knife Co., Northfield, Conn.
Parkhurst, L. D., Danvers, Conn.
Wiebusch & Hilger, Ltd., 9 to 15 Murray St., N. Y.

Cutting Off Machines
Harburt Rogers Mach. Co., So. Sudbury, Mass.
Lucas & Gilem, Philadelphia, Pa.

Dampers
Williams, A. C., Ravenna, O.

Dashes and Fenders
Dickinson Dash Co., Buffalo, N. Y.

Diamonds
Mendes-Cutting Factories, 12 to 16 John St., N. Y.

Diamond Tools
Dickinson, Thos. L., 45 Vesey St., N. Y.

Dies
Advantage Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Ferraente Mach. Co., Bridgeton, N. J.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Mossberg, Frank Co., Attleboro, Mass.
Richards Mfg. Co., Worcester, Mass.
Wilson & Smith, Worcester, Mass.

Door Belts, -See Belts and Gongs.

Door Chocks and Springs
Bardsley, Jos., 147 1/2 Baxter St., N. Y.
Larimer Mfg. Co., Pittsburgh, Pa.
Pullman Sash Balance Co., Rochester, N. Y.
Russell & Erwin Mfg. Co., New York.
Toiler, John, Sons & Co., Newark, N. J.

Door Holders
Brohard Co., Phila., Pa.
Calwell Mfg. Co., Rochester, N. Y.

Draught Springs
Burditt & Williams, Boston, Mass.

Draw Benches
Richard Mfg. Co., Bloomsburg, Pa.
Thompson, Hugh L., Waterbury, Ct.

Drawing Stands
Allen, D. H. & Co., Miamisburg, O.

Drill Grinders
Fuller Mfg. Co., Kalamazoo, Mich.
Heald, L. S. & Son, Barre, Mass.
Seiders, Wm. & Co., Worcester, Mass.
Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.

Drilling Machines
Aurora Tool Works, Aurora, Ind.
Baker Bros., Toledo, O.
Barnes, R. F. Co., Rockford, Ill.
Barnes, W. F. & John Co., Rockford, Ill.
Baush & Harris Mch. Tool Co., Springfield, Mass.
Bickford Drill & Tool Co., Cin., Ohio.
Bullard Machine Tool Co., Bridgeport, Ct.
Burnham, Geo. Co., Worcester, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Cincinnati Mch. Tool Co., Cincinnati, O.
Dallist, Thos. H. & Co., Philadelphia.
D'Amour & Littlefield Mch. Co., 131 Worth St., N. Y.
Davis, W. F., Machine Co., Rochester, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Dreses, Mueller & Co., Cincinnati, O.
Harrington, E. Son & Co., Phila., Pa.
Hill, Clarke & Co., Boston, Mass.
Hofer Mfg. Co., Freeport, Ill.
Prentice Bros., Worcester, Mass.
Quint, A. D., Hartford, Conn.
Sibley & Ware, So. Bend, Ind.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Slate Dwight Machine Co., Hartford, Conn.
Stow Flexible Shaft Co., Phila., Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
Woodward & Rogers, Hartford, Conn.
York & M. Co., Cleveland, Mass.

Drilling Machines, Automatic
Gould & Eberhardt, Newark, N. J.

Drills Pneumatic
Chicago Pneumatic Tool Co., Chicago, Ill.

Drop Forgings
Belden Machine Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn.
Chicago Drop Forging & Fdry. Co., Kensington, Ill.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Consolidated Railway Electric Lighting & Equipment Co., 60 Broadway, N. Y.
Eccles, Richard, Auburn, N. Y.
Indianapolis Drop Forging Co., Indianapolis, Ind.
Keystone Drop Forge Co., Philadelphia.
Kilburn & Bishop Co., New Haven, Conn.
R. I. Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
Seward, M. & Son Co., New Haven, Ct.
Springfield Drop Forging Co., Springfield, Mass.
Strleby & Foote Co., Newark, N. J.
Trenane & Williams Co., Alliance, O.
Williams, J. H. & Co., Brooklyn, N. Y.
Wyman & Gordon, Worcester, Mass.

Drop Hammers
Billings & Spencer Co., Hartford, Conn.
Williams, White & Co., Moline, Ill.

Drop Presses
McNelly, J. Mch. Co., Waterbury, Ct.
Mines & Peck Mfg. Co., New Haven, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Vulcan Iron Works, Chicago, Ill.

Dumplings
Energy Mfg. Co., Philadelphia, Pa.
Spindel, J. G., Reading, Pa.
St. John Mfg. Co., Newark, N. J.
Variety Machine Co., Warsaw, N. Y.

Dump Cars
Ashbolt & Screw Co., Cleveland, O.

Dynamos
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
Hanson & VanWinkle Co., Newark, N. J.
Robert Electric Mfg. Co., Troy, O.
Mayer, M. M., Electric Co., 2nd Ave. and 121st St., N. Y.
Stewart Electrical Co., Cincinnati, O.
Zucker & Levett & Loeb Co., 326-330 W. 25th St., New York.

Edge Trough Hangers
Gerger Bros. Co., Philadelphia, Pa.
Gutman Bros., Medina, O.

Edge Tools
Buck, Chas., Millbury, Mass.
Buck Bros., Millbury, Mass.
Morse Carbon Castings Co., Phila., Pa.
White, L. & J. Co., Buffalo, N. Y.

Egg Beaters
Lyon, Nelson, Albany, N. Y.
Standard Co., Boston, Mass.
Tatlin Mfg. Co., Forestville, Conn.

Elevators
Hartigan, W. R., Collinsville, Ct.
Electric Bells and Supplies
Strander, W. R. & Co., 24 Fulton St.
Cutter-Hammer Mfg. Co., Milwaukee, Wis.
Electric Controller & Supply Co., Cleveland, O.

Electric Lighting and Power Apparatus
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
Hobart Electric Mfg. Co., Troy, O.

Electrical Machinery
Stewart Electrical Co., Cincinnati, O.

Electrical Supplies
Mianus Electric Co., Mianus, Conn.

Electrotypes
St. Louis Electrotyping Foundry, St. Louis, Mo.

Elevators, Makers of
Eastern Machinery Co., New Haven, Ct.
Link-Belt Engineering Co., Phila., Pa.
Energy Mfg. Co., Phila., Pa.
Franklin Mach. Works, St. Paul, Minn.
Morsey, Williams & Co., Phila., Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.
Spindel, J. G., Reading, Pa.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati, O.

Elevator Buckets
Clark, W. J. & Co., Salem, O.
Lind & Elevator Bucket Co., Cleveland, O.

Elevator Enclosures and Cabs
Ludlow Saylor Wire Co., St. Louis, Mo.

Emery
Tanite Co., Stroudsburg, Pa.
Webster & Persa Tool Co., Springfield, Ohio.

Emery Wheels
American Emery Wheel Works, Providence, R. I.
Barnes, R. F. & Son, N. Y.
Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.
Diamond Mach. Co., Providence, R. I.
Nazel & Bassett, Phila., Pa.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Safety Emery Wheel Co., Springfield, O.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.
Springfield Mfg. Co., Bridgeport, Conn.
Star Corundum Wheel Co., Detroit, Mich.
Sterling Emery Wheel Co., Tiffin, O.
Tanite Co., Stroudsburg, Pa.
Vitrified Emery Wheel Co., Westfield, Mass.
Zacharias & Co., Asbury Park, N. J.

Emery Wheel Dresser
Chicago Screw Co., Chicago, Ill.
Dickinson, Thos. L., 45 Vesey St., N. Y.

Enamelled Ware
Bellvue Stamping Co., Harvey, Ill.

Enameling
Baltimore Enamel Co., Baltimore, Md.

Engineers and Contractors
Watson, Henry, Pittsburgh, Pa.
Erikson, Edw. E., Pittsburgh, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Hevl & Patterson, Pittsburgh, Pa.
Huber, S. V. Co., Pittsburgh, Pa.
Johann, Julius, Pittsburgh, Pa.
Kennedy, Walter, Pittsburgh, Pa.
Lamond, David, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
McClure, G. W. Son & Co., Pittsburgh, Pa.
Miller Engineering Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Penns. Engineering Wks., New Castle, Penna.

Ritter-Conley Mfg. Co. Pittsburgh, Pa.
Smythe, S. K. Co., Inc., Pittsburgh, Pa.
Swindle, W. & Bros., Pittsburgh, Pa.
Thompson, Hugh L., Waterbury, Ct.
Wellman Seaver Engineering Co., Cleveland, O.
Whiting Foundry Equipment Co., Harvey, Ill.

Engines
Mietz, Aug., 128-138 Mott St., N. Y.
Northern Engineering Works, Detroit, Mich.
Ruger, J. W. Mfg. Co., Buffalo, N. Y.
Wooley Fdry. & Mch. Wks., Anderson, Ind.

Gasoline
Charter Gas Engine Co., Springfield, Ill.
Ruger, J. W. Mfg. Co., Buffalo, N. Y.
Truett Boat Mfg. Co., St. Joseph, Mo.
Weber Gas & Gasoline Engine Co., Kansas City, Mo.
Watkins, F. M., Cincinnati, O.
Wooley Fdry. & Mch. Works, Anderson, Ind.

Kerosene
Mietz, Aug., 128-138 Mott St., N. Y.

Alis, E. P. Co. Milwaukee, Wis.
Boston Flower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Filer & Stowell Co., Milwaukee, Wis.
Lefel, James & Co., Springfield, O.
Tredell, F. W. & Co., Portland, Me.
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.
Senne Geo. B. Co., Youngstown, O.
Southwick Fdry. & Mch. Co., Philadelphia, Pa.
Stellor Bros. & Co., Boston, Mass.
Totten & Hoag Iron & Steel Fdry. Co., Pittsburgh, Pa.
Wetherill, Robt. & Co., Chester, Pa.

Engines, Second Hand
Everson, B. M., Pittsburgh, Pa.

Engravers
Mugford A., Hartford, Conn.

Expanding Handrails
Letourneau Wm. G. & Co., Norwalk, Conn.

Expansion Bolts
Church, Isaac Toledo, O.
McCabe Hanger Mfg. Co., 538-540 W. 22d St., N. Y.

Exporters
Shelby & Co., London, Eng.

Farmers' Tools
Heller Bros. & Co., Newark, N. J.

Faucets, Wood
Boston & Lockport Block Co., Boston, Mass.
Sommer's, John, Son, Newark, N. J.

Feed Cutters
Glover Mfg. Co., Salem, O.

Feed Water Heaters and Purgers
Harrison Safety Boiler Works, Philadelphia, Pa.
Keller, R. F. & Son, 91 Liberty St., N. Y.
National Pipe Bending Co., New Haven, Conn.
Patterson, F. L., 136 Liberty St., N. Y.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Wheeler, oil Pipe Co., Elmwood, Ct.

Felt Washers
Bowen Mfg. Co., Auburn, N. Y.

Fencing, Iron and Wire
Adam, W. J., Joliet, Ill.
American Steel & Wire Co., Chicago, Ill.
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
Dwiggins Wire Fence Co., Anderson, Ind.
Ellis & Halfenbarger, Indianapolis, Ind.
Frost Wire Fence Co., Cleveland, O.
Gilbert & Bennett Mfg. Co., 42 Cliff St.
Hartman Mfg. Co., 309 Broadway, N. Y.
Kilmer Wire Mfg. Co., Chicago, Ill.
Ludlow Saylor Wire Co., St. Louis, Mo.
Stewart Iron Works, Cincinnati, Ohio.
Up-to-date Mfg. Co., Terre Haute, Ind.

Ferro-Chromium
Wilson Aluminum Co., 99 Cedar Street, N. Y.

File Cutting Machinery
Hoschke Machine Works, Phila., Pa.

Files and Rasps
Manufacturers of
Arcade File Works, Anderson, Ind.
Barnett, G. & H. Co., 41 & 43 Richmond Phila.
Duncan, Henry & Sons, Inc., Phila., Pa.
Heller Bros. Co., Newark, N. J.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.
Stokes Bros. Mfg. Co., Freehold, N. J.

Filing Cabinets
Globe-Emrick Co., Cincinnati, O.

Filters
Scaife, Wm. B. & Sons, Pittsburgh, Pa.

Finished Castings
Franklin, H. H. Mfg. Co., Syracuse, N. Y.

Fire Brick
Borgner, Cyrus, Philadelphia, Pa.
Gardner Bros., Cumberland, Md.
Haws, W. H. Fire Brick Co., Mt. Union, Pa.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Presbury Fire Brick Co., Taunton, Mass.
Staten Island Clay Co., Woodbridge, N. J.
Taylor, Charles Sons Co., Cincinnati, O.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets
Troy Nickel Works, Troy, N. Y.

Fishing Tackle
Dunn, Stoddard & Co., Boston, Mass.

Flexible Shafting
Chicago Flexible Shaft Co., Chicago, Ill.
Stow Flexible Shaft Co., Phila., Pa.
Stow Mfg. Co., Binghamton, N. Y.

Flint and Emery Paper
Bader, Adamson & Co., Phila., Pa.

Floor and Ceiling Plates
Coddling Mfg. Co., Bristol, Conn.

Floor Hinge
Lawson Mfg. Co., Milwaukee, Wis.

Flue Cleaners
Jackson Flue Scraper Co., Jackson, Mich.

Flue Killers
Jarecki Mfg. Co., Erie, Pa.
Bigelow, J. F., Worcester, Mass.

Fly Traps
Hewes, Fred. J. Mfg. Co., Hamilton, O.

Foot Pumps
Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.

Foot Rests
Star Steel Plate Co., Newark, N. J.

Forges, Portable, &c.
Bradley Co., Syracuse, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Fairbanks Co., 311 Broadway, N. Y.
Smyth, B. F. Co., Boston, Mass.

Forgings, Iron and Steel
Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.
Bethlehem Steel Co., S. Bethlehem, Pa.
Columbus Forge & Iron Co., Columbus, O.
Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Phila., Pa.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Hess Steel Co., Ltd., Cleveland, Ohio.
Hutchinson Shear, Knife & Machine Co., Pittsburgh, Pa.
Titusville Forge Co., Titusville, Pa.

Forks, Hay and Manure
Ely Rice & Fork Co., St. Johnsbury, Vt.
Jesse Farming Tool Co., Ft. Madison, Ia.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

Foundry Facings
Cleveland Facing Mill Co., Cleveland, O.
Obernauer, S. Co., Cincinnati, O.

Foundry Lamps
Forest City Foundry & Mfg. Co., Cleveland, Ohio.

Foundry Molasses
Tausig, N. W. & Co., 111 Wall St., N. Y.

Foundry Supplies
Cleveland Facing Mill Co., Cleveland, O.
Gilmour, J., Bennett Building, N. Y.
Gorman, S. Co., Cincinnati, Ohio.
Gorman Mfg. Co., Cleveland, O.
Paxson, J. W. Co., Phila., Pa.
Tausig, N. W. & Co., 111 Wall St., N. Y.

Friction Clutches
Eastern Machinery Co., New Haven, Ct.

Furnaces, Foundry
Bryan & Co., Detroit, Mich.

Furnaces, Oil, Gas and Coal
Rockwell Engineering Co., 26 Courtland St., N. Y.

Gages
Endicott Blackford & Co., Simsbury, Ct.

Gages
Crosby Steam Gage & Valve Co., Boston.

Galvanized Ware
Keen & Hagerly Mfg. Co., Baltimore.

Galvanizing
Blackman & King, 801 Greenwich St., N. Y.
Cleveland Galvanizing Works, Cleveland, O.
Empire Pipe Bending & Supply Co., Brooklyn, N. Y.

Galvanizing Process
U. S. Electro Galvanizing Co., 348 Broadway, N. Y.

Garden Rakes
Jenkins Iron & Tool Co., Howard, Pa.

Garden Tools
Withington & Cooley Mfg. Co., Jackson, Mich.

Gas Compressor
Cushing, Steinbart & Co., Ltd., Carlisle, N. J.

Gas Compressors
Norwalk Iron Works Co., So. Norwalk, Conn.

Gas Furnaces
Chicago Flexible Shaft Co., Chicago, Ill.

Gaskets
Canfield, H. O., Bridgeport, Conn.

Gaskets, Iron
Smith on Mfg. Co., Jersey City, N. J.

Gas Lamps
Imperial Gas Lamp Co., Chicago, Ill.

Gas Producers
Duff Patents Co., Allegheny, Pa.
Smythe, S. R. Co., Inc., Pittsburgh, Pa.
Swindle, W. & Bro., Pittsburgh, Pa.

Gauges, Rolling Mill
Haines Gauge Co., Philadelphia, Pa.

Gears
Boston Gear Works, Boston, Mass.
Cresson, Geo. V. Co., Philadelphia, Pa.
Gleason Tool Co., Rochester, N. Y.
Morse, Williams & Co., Phila., Pa.
Ruttall, R. D. Co., Allegheny, Pa.
Ponze, Robert, Son & Co., Baltimore, Md.

Gears, Rawhide
Hornburgh & Scott, Cleveland, Ohio.
Nazel & Bussett, Phila., Pa.

Gear Tools
Becker-Brainard Milling Machine Co., Hyde Park, Mass.
Bultman, F. H. & Co., Cleveland, O.
Gould & Eberhardt, Newark, N. J.
Whitton, D. E. Mch. Co., New London, Ct.

Glimmers
No. 10 Mfg. Co., Chester, Conn.

Glass Cutters
Barrett, W. L., Bristol, Conn.
Bushman, F. H. & Co., Cleveland, O.
Morse, S. E., Cantonville, Conn.

Glass Cutting Boards
Larkin Rule Co., Saginaw, Mich.

Glue
Hosier, Adamson & Co., Phila., Pa.
Taylor & Co., 35 Chambers St., N. Y.

Golf Woods
Whitcomb Gun Implement Co., 313 Broadway, N. Y.

Grass Catcher
Grass Catcher Co., Dayton, O.

Grass, Raking
Grass Rake Co., Youngstown, O.

Grinding and Polishing Mchs.
American Emery Wheel Works, Providence, R. I.
Barnes, W. F. & John Co., Rockford, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Milling Mach. Co., Cincinnati, O.
Diamond Mach. Co., Providence, R. I.
Farnham Mfg. Co., Kalamazoo, Mich.
Hutchinson Emery Wheel Co., Leeds, Mass.
Newbury Emery Wheel Co., Worcester, Mass.
Smyth Emery Wheel Co., Springfield, O.
Speed Mfg. Co., Bridgeport, Conn.
Stearns Emery Wheel Co., Detroit, Mich.
Tanner Co., Stroudsburg, Pa.
Universal Mach. Co., Providence, R. I.

Grindstones
Cleveland Stone Co., Cleveland, O.
Velox Machine Works, Chicago, Ill.

Grabbing Machine
Century Mfg. Co., 43 E. 8th St., N. Y.

Gun Implements
Union Hardware Co., Torrington, Conn.

Guns
Main Fire Arms Co., New Haven, Ct.
Remington Arms Co., 815 Broadway, New York

Gymnasium Apparatus
Narravansett Mch. Co., Providence, R. I.

Hack Saws
Dietsch, Henry & Sons, Inc., Phila., Pa.
Goodell-Pratt Co., Springfield, Mass.
Springfield Machine Screw Co., Springfield, Mass.

Hammers
Heller Bros. Co., Newark, N. J.
Logan & Strobridge Iron Co., New Brighton, Pa.

Hammers, Pneumatic
Chicago Pneumatic Tool Co., Chicago, Ill.
O. C. Co., Chicago, Ill.

Standard Pneumatic Tool Co., Chicago, Ill.

Hammocks
Palmer, L. E., Middletown, Conn.
Dodge Mill Mfg. Co., Janesville, Wis.

Hand Screws
Bliss, R. Mfg. Co., Pawtucket, R. I.

Handle Machinery
Deane Machine Works, Deane, O.

Hangers, Barn Door
Coleman Hardware Co., Chicago, Ill.

Hanger Doors
Chicago Spring Butt Co., Chicago, Ill.
Columbian Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.
Lawrence Hardware Co., Springfield, Ill.
Louden Machinery Co., Fairfield, Iowa.
McCabe Hanger Mfg. Co., 531-543 W. 22d St., N. Y.
McKinney Mfg. Co., Allegheny, Pa.
Ney Mfg. Co., Canton, Ohio.
Sawell Mfg. & Foundry Co., So. Milwaukee, Wis.
Wilcox Mfg. Co., Aurora, Ill.

Hangers, Shafting
Ball Bearing Co., Boston, Mass.
Columbian Hardware Co., Chicago, Ill.
Machinists Supply Co., Rochester, N. Y.

Hangers, Storm Window and Screen
Phoenix Mfg. Co., Milwaukee, Wis.

Hardware Comm'n Merchants
Graham, John H. & Co., 113 Chambers St., N. Y.
Rungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Hardware Manufacturers
Ayrault Mfg. Co., Freeport, Ill.
Columbian Hardware Co., Chicago, Ill.
Logan & Strobridge Iron Co., New Brighton, Pa.
Millers Falls Co., 23 Warren St., N. Y.
New Mfg. Co., Canton, Ohio.
Ney Mfg. Co., Canton, Ohio.
Parker, Chas. Co., Meriden, Conn.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.
Russell & Erwin Mfg. Co., New York.
Stanley Works, New Britain, Conn.
Union Mfg. Co., Cleveland, Ohio.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
Wrightsville Hdw. Co., Wrightsville, Pa.

Hardware Mfrs.' Agents
Graham, John H. & Co., 113 Chambers St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Hardware Shelving
Warren, J. D. Mfg. Co., Chicago, Ill.

Hardware Specialties
Acme Shear, Bridgeport, Conn.
Berger Bros. Co., Philadelphia, Pa.
Chantrell Tool Co., Reading, Pa.
Enterprise Mfg. Co., of Pa., Phila., Pa.
Graham, John H. & Co., 113 Chambers St., N. Y.
Kohler, F. E. & Co., Canton, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Scranton & Co., The, New Haven, Ct.
Smith & Edge Mfg. Co., Bridgeport, Ct.
Wilson & Smith, Worcester, Mass.

Harnesses
Buffalo Harness Mfg. Co., Buffalo, N. Y.

Harness Straps
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.

Hatchets
Jenkins Iron & Tool Co., Howard, Pa.

Hay Carriers
Janesville Hay & Tool Co., Janesville, Wis.

Hay Knives
Clark & Parsons Co., E. Wilton, Me.
New Mfg. Co., Canton, Ohio.

Hay Hooks
Goshen Mfg. Co., Goshen, Ind.
Janesville Hay & Tool Co., Janesville, Wis.

Hay Tools
Janesville Hay & Tool Co., Janesville, Wis.

Hay Tools
Louden Machinery Co., Fairfield, Iowa.
Myers, F. E. & Bro., Ashland, O.
New Mfg. Co., Canton, O.

Henting and Ventilating Apparatus
American Blower Co., Detroit, Mich.
Bavley, Wm. & Sons Co., Milwaukee, Wis.
Boston Flower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Farnham Mfg. Co., Kalamazoo, Mich.
Smyth, B. F. & Son, Holyoke, Mass.
Smyth, B. F. & Son, Boston, Mass.

Heel Plates
Star Steel Plate Co., Newark, N. J.

Hinges
Easy Spring Hinge Co., Shelby, O.
Hatchett Tool Co., E. Tool Co., Howard, Pa.
Lawrence Bros., Sterling, Ill.
McKinney Mfg. Co., Allegheny, Pa.
Stanley Works, New Britain, Conn.
Tibout, W. & J., 113 Chambers St., N. Y.

Hitching Posts
Hitching Post Co., 309 Broadway, N. Y.

Hoes, Garden, Planters, &c.
Iowa Farming Tool Co., Fort Madison, Iowa.
Jenkins Iron & Tool Co., Howard, Pa.

Holists, Air
Pedrick & Ayer Co., Philadelphia, Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.

Holists, Chain and Rope
Allegheny Machine Co., Allegheny, Pa.
Box, Alfred & Co., Philadelphia, Pa.
Chisholm & Moore Mfg. Co., Cleveland, Ohio.
Dunn, Jas. P., Cleveland, O.
Eckstein, C. G., 243 Centre St., N. Y.
Fulton Iron & Engine Works, Detroit, Mich.
E. Frington, E. Son & Co., Phila., Pa.
McCoy, Joe. & Co., 26 Warren St.
Reading Crane & Hoist Works, Reading, Pa.
Speidel, J. G., Reading, Pa.

Hoisting Machines
Eastern Machinery Co., New Haven, Ct.
Lidgerwood Mfg. Co., 56 Liberty St., N. Y.

Hollow Mill
Geometric Drill Co., Westville, Conn.

Hollow Ware
Avery Stamping Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
New York Stamping Co., Brooklyn, N. Y.
Rogers, Jno. M. Boat-Gauge & Drill Works, Gloucester, City, N. J.
Rome Mfg. Co., Rome, N. Y.

Horse Nails
Capewell Horse Nail Co., Hartford, Ct.
Mooney, W. M. & Co., Ausable Chasm, N. Y.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Newport, Boston.
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Horse and Mule Shoes
Burden Iron Co., Troy, N. Y.
Phonix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence, R. I.

Horsehoe Studs
Leonhart & Co., Berlin, Schoneberg, Germany.

Hose
Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren Street, New York.

Hose Couplings
Clark, W. J. & Co., Salem, Ohio.

Hose Coupling, Air
Pedrick & Ayer Co., Philadelphia, Pa.

Hose Washers
Canfield, H. O., Bridgeport, Conn.

House Furnishing Specialties
Williams, A. C., Ravenna, O.

Hydrants
Reading Fdry. Co., Reading, Pa.

Hydraulic Jacks
Dudzeon, Richard, 24 Columbia St., N. Y.
Harrison-Stillman Co., 234 E. 43d St., N. Y.

Hydraulic Machinery
Watson-Stillman Co., 234 E. 43d St., N. Y.

Hydraulic Tools
Watson-Stillman Co., 234 E. 43d St., N. Y.
Wood, R. D. & Co., Phila., Pa.

Ice Cream Dishers
Seymour Mfg. Co., Boston, Mass.

Ice Cream Freezers
North Bros. Mfg. Co., Philadelphia, Pa.
Tatum, Sam'l C. Co., Cincinnati, O.
White Mountain Freezer Co., Nashua, N. H.

Ice Creepers
Gay Geo. E. Augusta, Me.

Ice Making Machinery
York Mfg. Co., York, Pa.

Ice Picks
Dodge Machine Screw Co., Boston, Mass.

Ice Shredders
Enterprise Mfg. Co., Philadelphia, Pa.
Erie Specialty Co., Erie, Pa.

Ice Tools
Guthrie, Peter & Co., Cleveland, O.
Williams, A. C., Ravenna, O.
Wood, Wm. T. & Co., Arlington, Mass.

Injectors
Jenkins Bros., New York.

Insulators
Sillim, E. F. & Co., Chester, Conn.

Insurance, Boiler
Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn.

Iron and Steel, Swedish
Hartford, Arthur C. Co., Boston, Mass.
Hilberg, N. J., 151 Broadway, N. Y.
Lilje, A. & Co., 1 Broadway, N. Y.
Ports, Horace F. & Co., Phila., Pa.

Iron Commission Brokers
Cotton & Co., Phila., Pa.
Cotton, Barclay W. & Co., Phila., Pa.
Cox, Justice, Jr. & Co., Ltd., Phila., Pa.
Etting, Edw. J., Philadelphia.
Keeler, Jerome & Co., Philadelphia.
Law, Ernest & Co., Phila., Pa.
Leas, Henry & Co., Philadelphia.
Lea, J. T. & Co., Philadelphia.
Mohr, J. J., 39 Walnut St., Philadelphia.
Thomas, Theodore, Utica, N. Y.
Wister, L. & Co., Phila., Pa.

Iron Manufacturers
New York, J. B. & Co., Philadelphia, Pa.

Iron, Republic
Republic Iron & Steel Co., Chicago, Ill.

Iron, Republic
Bole, Ross & Co., Pittsburgh, Pa.
Cotton, Barclay W. & Co., Phila., Pa.
Cuthbert, H. M., Phila., Pa.
Lilje, Ernest & Co., Phila., Pa.
Melones, C. E. & Co., Phila., Pa.
Ogden & Wallace, 577-583 Greenwich St., N. Y.
Peters & Co., 23 Broadway, N. Y.
Potts, Horace T. & Co., Phila., Pa.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 65 E. 17th St., N. Y.
Wheeler, Mifflin & Co., Phila., Pa.
Wilson, E. H. & Co., Philadelphia.

Wheelock-Lovejoy & Co., New York and Boston.

Iron, Galvanized Sheet—See Sheets, Galvanized.

Iron Sheet—See Sheets, Iron and Steel.

Iron Ore
Nicoll, B. & Co., 68 Wall St., N. Y.
Pilling & Crane, Phila., Pa.
Pullman, J. Wesley, Phila., Pa.

Iron Puts
Wright, Chicago, Ill.

Ironwork, Ornamental
Adam, W. J., Joliet, Ill.
Barnum, E. T., Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
Van Dorn Iron Wks. Co., Cleveland, O.

Japanning
Warner Bros. Co., Bridgeport, Conn.

Jewelry
Myers, S. F. Co., 48-50 Malden Lane, N. Y.

Job Lots, Hardware
Chicago House Wrecking Co., Chicago, Ill.

Joist Hanger
Van Dorn Iron Wks. Co., Cleveland, O.

Keys
Bell, Edwin & Sons Co., Youngstown, O.

Key Sentries
Baker Bros., Toledo, Ohio.

Keys, Machine
Morton Mfg. Co., Muskegon Heights, Mich.

Keys, Split and Riveted
Hollinger Fence Co., Greenville, O.

Kitchen Utensils
Bellair Stamping Co., Harvey, Ill.

Knife and Tool Grinder
Union Mfg. Co., Buffalo, N. Y.

Knives
Kimball, C. J. Co., Bennington, N. H.

Laboratory Outfits
Elmer & Amend, New York.

Ladders
Goshen Mfg. Co., Goshen, Ind.
Handy Ladder Works, Cleveland, O.

Lamp Stoves
Litchfield, J. M., 105 Beekman St., N. Y.

Lamps
Imperial Gas Lamp Co., Chicago, Ill.
Miller, Edward & Co., Meriden, Ct.

Lamps, Gasoline
Brilliant Gas Lamp Co., Chicago, Ill.
Merkel, H. St. Louis, Mo.
Metropolitan Daylight Lamp Co., Chicago, Ill.

Lasts and Last Stands
Kupferle, Jno. C., St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

Lathe Dogs
LeCount, Wm. G., So. Norfolk, Conn.

Lathes
American Tool Works Co., Cincinnati, Ohio.
Barker-Charnd Mch. Tool Co., Cincinnati, Ohio.
Barnes, B. F. & Co., Rockford, Ill.
Bement, Miles & Co., Phila., Pa.
Brown & Sharpe Mfg. Co., Providence, R. I.
Bullard Mach. Tool Co., Bridgeport, Ct.
Davis, W. F. Machine Co., Rochester, N. Y.
Draper Mch. Tool Co., Worcester, Mass.
Fish, H. C. Mch. Wks., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr. & Co., Phila., Pa.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Shipley Mch. T. Co., Cincinnati, O.
McCabe, J. J., 14 Dey St., N. Y.
New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works, Hamilton, O.
Potter & Johnson Co., Pawtucket, R. I.
Pratt & Whitney Co., Hartford, Conn.
Prentice Bros., Worcester, Mass.
Ross, Josiah, Buffalo, N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Silk, Anderson Co., Cincinnati, Ohio.
Young, W. C. Mfg. Co., Worcester, Mass.

Lathing, Wire
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Lawn Mowers
Goldwell Lawn Mower Co., Newburgh, N. Y.
Supplier Hardware Co., Phila., Pa.

Lawn Mower Sharpeners
Wilcox Mfg. Co., Aurora, Ill.
Zacharias & Co., Asbury Park, N. J.

Lawn Rakes
Kouler, F. & Co., Canton, O.

Lawn Sprinklers
Crescent Brass & Iron Co., Detroit, Mich.
Kupferle, Jno. C., St. Louis, Mo.
McGowan, John H. Co., Cincinnati, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

Lawn Swings
Goshen Mfg. Co., Goshen, Ind.

Lead Washers
Littleford Bros., Cincinnati, Ohio.

Lemon Squeezers
Hagen & Reid, Troy, N. Y.
Lohan & Strohbridge Iron Co., New Brighton, Pa.
Williams, A. C., Ravenna, O.

Lockers
Narravansett Mch. Co., Providence, R. I.

Locks and Knobs
Norwalk Lock Co., So. Norwalk, Conn.
Reading Hdw. Co., Reading, Pa.
Russell & Erwin Mfg. Co., New York.
U. S. Steel Lock Co., Clinton, Iowa.

Locomotives
Everson, B. M., Pittsburgh, Pa.

Logging Tools
Gerlach, Peter & Co., Cleveland, Ohio.

Lubricants
Inxon, Jos., Crucible Co., Jersey City, N. J.

Lumbering Tools
Morley Bros., Saginaw, Mich.

Lunch Boxes
Seavey Mfg. Co., Boston, Mass.

Machinery
Acme Machinery Co., Cleveland, Ohio.
Atbeck, Geo. E., 109 Liberty St., N. Y.
Alax Mfg. Co., Cleveland, Ohio.
American Tool Wks. Co., Cincinnati, O.
Bailey, U. Machinery Co., Pittsburgh, Pa.
Barnes, W. F. & John Co., Rockford, Ill.
Baush & Harris Mch. Tool Co., Springfield, Mass.
Becker-Brainard Milling Mach. Co., Hyde Park, Mass.
Bement, Miles & Co., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 13 Broadway, N. Y.
Brown & Sharpe Mfg. Co., Providence, R. I.
Bullard Mch. Tool Co., Bridgeport, Ct.
Carlin Machinery & Supply Co., Allegheny, Pa.
Carlin's Sons, Thos., Allegheny, Pa.
Chesley Machinery Co., Havermer Bldg., N. Y.
Cincinnati Milling Mach. Co., Cin. O.
Cincinnati Planer Co., Cincinnati, Ohio.
Cincinnati Shaper Co., Cincinnati, O.
Cook T. W. G. 6 Beade St., N. Y.

Cornell, J. B. & J. M., 26th St. and 11th Ave., New York City.
 Cross & Speirs Mach. Co., Waterbury, Conn.
 Davis, W. P. Machine Co., Rochester, N. Y.
 Dawson, A. L. & Co., Chicago, Ill.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Diamond Drill & Mch. Co., Birdsboro Pa.
 Donah, J. B. & Co., Chicago, Ill.
 Draper Mach. Tool Co., Worcester Mass.
 Farrel Fdry & Mch. Co., Ansonia, Conn.
 Ferracute Machine Co., Bridgeton, N. J.
 Fish, H. C. Machine Works, Worcester, Mass.
 Garvin Machine Co., Spring and Varick Sts., N. Y.
 General Supply Co., 40 John St., N. Y.
 Geometric Drill Co., Westville, Conn.
 Gray, Robt. J., 32-54 E. 132d St., N. Y.
 Hendey Machine Co., Fortington, Conn.
 Hill, Henry F., Boston, Mass.
 Hill, Clarke & Co., Boston, Mass.
 Johnson, Israel H., Jr., & Co., Phila.
 Johnson, Wm. C. & Sons Mch. Co., St. Louis, Mo.
 Kainer, A. V. & Co., Phila., Pa.
 Keagy & Lear Mch. Co., Cohocton, O.
 Kerrick, J. H., Minneapolis, Minn.
 Lodge & Shipley Mch. Tool Co., Cin., O.
 Lund, S. T., Boston, Mass.
 McCabe, J. J., 14 Day Street, N. Y.
 McDowell, Stocker & Co., Chicago.
 Manning, Maxwell & Moore, 51-59 Liberty St., N. Y.
 Manville, E. J. Mach. Co., Waterbury, Ct.
 Marshall & Huchart Mchry. Co., Chicago, Ill.
 Mossberg, Frank Co., Attleboro, Mass.
 National Machine & Tool Co., Tiffin, Ohio.
 New Duty Mfg. Co., Janesville, Wis.
 New Haven Mfg. Co., New Haven, Conn.
 New York Machinery Depot, 125 Broadway, New York.
 Nilson Tool Wks., 138 Liberty St., N. Y.
 Nilson A. L. Mch. Co., Bridgeport, Ct.
 Norton, W. D., Cincinnati, O.
 Norwood Bicycle Co., Cincinnati, O.
 Paradox Machinery Co., Chicago, Ill.
 Pennsylvania Machinery Co., Phila., Pa.
 Phila. Machine Tool Co., Phila., Pa.
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
 Poole, Robt. & Son Co., Baltimore, Md.
 Potter & Johnston Co., Pawtucket, R. I.
 Poulter & Co., Phila., Pa.
 Pratt & Whitney Co., Hartford, Conn.
 Prentiss Bros., Worcester, Mass.
 Prentiss Tool & Supply Co., 115 Liberty St., N. Y.
 Rainer & Williams, Chicago, Ill.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
 Seyfert's Sons L. F., Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Conn.
 Silk, Anderson Co., Cincinnati, Ohio.
 Thomas & Lowe Machinery Co., Providence, R. I.
 Toomey, Frank, Philadelphia, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
 Wetherill Robert & Co., Chester, Pa.
 Windsor Machine Co., Windsor, Vt.
 York, S. M. Co., Cleveland, O.

Machinery, Wood Working
 American Mach'y Co., Grand Rapids, Mich.
 Deffance Machine Wks., Deffance, O.
 Fay, J. A. & Co., Cincinnati, Ohio.

Machinery Springs
 Scott, Chas. Spring Co., Phila., Pa.

Machinery Builders
 Chapman, J. B. & Co., Springfield, Mass.

Machine Knives
 Loyd, John, 538-542 Water St., N. Y.

Machine Screws—See Screws, Machine

Machine Screw Work
 Spencer Automatic Mch. Screw Co., Hartford, Conn.

Machine Tools—See Machinery

Machine Wrenches
 Nuttall, R. D. Co., Allegheny, Pa.

Machinists' Scales
 Billings & Spencer Co., Hartford, Conn.

Machinists' Tools and Supplies
 Billings & Spencer Co., Hartford, Conn.
 General Supply Co., 40 John St., N. Y.
 King, J. M. & Co., Waterford, N. Y.

Manganese Bronze
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Manifolds
 Atkin C. B., Knoxville, Tenn.

Manufacturing Properties
 Hillman, J. H. & Co., Pittsburgh, Pa.

Manufacturing Sites
 Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
 Southern Railway Co., Washington, D. C.

Measuring Machines
 Rogers, Jno. M. Ross, Gauge & Drill Wks., Gloucester City, N. J.

Meat Choppers
 Enterprise Mfg. Co. of Pa., Phila., Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Street, V. R. & Co., Rochester, N. Y.
 Woodruff, O. D., Potstown, Pa.

Mechanical Stokers
 Ideal Fuel Feeder Co., 31 Burling Slip, N. Y.

Metal Brokers
 American Metal Co., 32 Broadway, N. Y.

Metal Ceilings
 Penn Metal Ceiling & Rfg. Co., Phila., Pa.

Metal Factors
 Stroud, E. H. & Co., Chicago, Ill.

Metal Lathing
 Penn Metal Ceiling & Roofing Co., Phila., Pa.

Metals
 Hendricks Bros., 49 Cliff St., N. Y.
 Hoteller, Theo. & Co., Buffalo, N. Y.
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
 Butler, A. T., 256 Broadway, N. Y.
 United Metals Selling Co., 11 Broadway, N. Y.

Metal Polish
 Hoffman, Geo. W., Indianapolis, Ind.

Metal Spinning
 Goodwin & Kintz Co., Winsted, Conn.

Milling Machines
 Adams Co., Dubuque, Iowa.
 Becker-Brainard Milling Machine Co., Hyde Park, Mass.
 Brown & Sharpe Mfg. Co., Providence.

Carter & Hakes Mach. Co., Winsted, Ct.
 Cincinnati Milling Mach. Co., Cin., O.
 Fox Machine Co., Grand Rapids, Mich.
 Garvin Machine Co., Spring and Varick Sts., N. Y.
 Ingersoll Milling Mach. Co., Rockford, Ill.
 Lucas & Glem, Philadelphia, Pa.
 Niles Tool Works, Hamilton, O.

Mining Knives
 Bishop, Geo. H. & Co., Cincinnati, O.
 Palmer Hdw. Mfg. Co., Troy, N. Y.

Mining Machinery
 Allis, E. P. Co., Milwaukee, Wis.
 Rand Drill Co., 100 Broadway, N. Y.

Mining Screens
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton St., N. Y.
 Michigan Wire Cloth Co., Detroit, Mich.

Miter Boxes
 Thomson Bros. & Co., Lowell, Mass.

Molding Machines
 Adams Co., Dubuque, Iowa.
 Maywood Fdry & Mch. Co., Chicago.
 Primmore, Henry E., Chicago, Ill.

Mop Wringers
 Tech Novelty Co., Mansfield, O.

Motor Fans
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Motors, Air
 Stow Flexible Shaft Co., Phila., Pa.

Motors, Petroleum
 Petroleum Mfg. Co., Long Island City, N. Y.

Motors, Electric
 Eddy Electric Mfg. Co., Windsor, Conn.
 General Electric Co., Schenectady, N. Y.
 Stewart Electrical Co., Cincinnati, O.
 Stuckert, B. F. Co., Boston, Mass.

Motors, Vapor Marine
 Truscott Boat Mfg. Co., St. Joseph, Mich.

Nail Clippers
 Cook, H. C. & Son, Ansonia, Conn.

Nail Machinery
 Basa Machine Co., Joliet, Ill.
 Crescent Mfg. Co., Belleville, Ill.
 Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nail Pullers
 Atwater Mfg. Co., Southington, Conn.
 Bridgeport Mfg. Co., Bridgeport, Conn.
 Hazen & Held, Troy, N. Y.
 Scranton & Co., The, New Haven, Conn.
 Snow L. T., New Haven, Conn.

Name Plates, Machinery
 Livermore, Homer F., Boston, Mass.
 Murdoch & Farley (Rate Co.), Boston, Mass.

Natural Gas Pumps
 Norwalk Iron Wks. Co., So. Norwalk, Ct.

Nickel Platers' Supplies
 Eddy Electric Mfg. Co., Windsor, Conn.
 Hanson & Van Winkle Co., Newark, N. J.
 Zuecker & Levetz & Loeb Co., 326-330 W. 25th St., New York.

Nickeloid
 American Nickeloid Co., Peru, Ill.

Norway Shapes
 Rowland, William & Harvey, Frankford, Philadelphia.

Nuts—See Bolts

Nuts, Self-Locking
 National Elastic Nut Co., Milwaukee, Wis.

Nut Machines
 Tumbler Nut Co., Unionville, Conn.

Oil Burning Appliances
 Rockwell, Engineering Co., 26 Cortlandt St., N. Y.

Oil Cups
 Brown Mfg. Co., Auburn, N. Y.

Oil Heaters—See Oil Stoves

Oil Stones
 Pike Mfg. Co., Pike Station, N. H.

Oil Stoves—(See Stoves Oil, Vapor and Gasoline)

Oilers
 Gen Mfg. Co., Pittsburgh, Pa.
 Hammer & Co., Branford, Conn.
 Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.

Oilless Bearings
 North American Metalline Co., Long Island City, N. Y.

Ore Breakers
 Aultman Co., Canton, O.
 Cresson, Geo. V. Co., Phila., Pa.

Ore Shovels
 The Automatic Shovel Co., Lorain, O.

Ores
 Blair, Reed F. Co., Pittsburgh, Pa.
 Samuel, Frank, Philadelphia, Pa.
 Wister, Francis, Philadelphia, Pa.

Ox Shoes
 Scranton Forging Co., Scranton, Pa.
 Woodruff, Walter W. & Sons, Mt. Carmel, Conn.

Packing
 Boston Belting Co., Boston, Mass.
 Morrison, Robert, St. Louis, Mo.
 Peckless Rubber Mfg. Co., 16 Warren Street, N. Y.

Packing, Iron
 Smooth On Mfg. Co., Jersey City, N. J.

Paints
 Dixon, Jos. Crucible Co., Jersey City.

Pants Stretcher
 Covert Mfg. Co., West Troy, N. Y.

Paper Mill Machinery
 Kelly, The O. S. Co., Springfield, O.

Patent Solicitors
 Gosnell & Kuegner, 230 Broadway, N. Y.
 Hamlin, Geo. R., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Patterson, E. P., Washington, D. C.

Pattern Letters
 Cleveland Galvanizing Works, Cleveland, O.

Pattern Making Machinery
 American Mach'y Co., Grand Rapids, Mich.

Perforated Metal
 Clinton Wire Cloth Co., Clinton, Mass.
 Erdle & Schenck, Rochester, N. Y.
 Harrington & King Perforating Co., Chicago, Ill.
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Phosphor Bronze
 Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
 Phosphor Bronze Smelting Co., Limited, Philadelphia.

Phosphor Tin
 Crescent Phosphorized Metal Co., Philadelphia, Pa.

Piano Plate Manufacturers
 Hark & Naumann, 518 Pearl St., N. Y.

Piano Wire
 Randolph Iron Co., Brooklyn, N. Y.

Picture Wire
 Ossawa Mills Co., Norwich, Conn.

Pig Casting Machines
 Heyl & Patterson, Pittsburgh, Pa.

Pig Iron
 Ashland Steel Co., Ashland, Ky.
 Baird, C. E. & Co., Phila., Pa.
 Danville Bessemer Co., Danville, Pa.
 Dimmick, J. K. & Co., Phila., Pa.
 Hickman, Williams & Co., Chicago, Ill.
 Houston, C. B. & Co., Philadelphia, Pa.
 Nicoll, B. & Co., 68 W. 11 St., N. Y.
 Samuel, Frank, Philadelphia, Pa.
 Stoss-Sherfield Steel & Iron Co., Birmingham, Ala.

Pig Iron Storage
 Am. Pig Iron Storage Warrant Co., 4 Wall St., N. Y.

Pig Lead
 Penna. Smelting Co., Pittsburgh, Pa.

Pile Drivers
 Vulcan Iron Works, Chicago, Ill.

Pipe Benders
 National Pipe Bending Co., New Haven, Conn.
 National Tube Co., Pittsburgh, Pa.
 Whitlock & Co. Pipe Co., Elmwood, Ct.

Pipe Coupling
 Blodgett, H. J. & Co., Brooklyn, N. Y.

Pipe Cutting and Threading Machines
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keefer Mfg. Co., Edwardsville, Ill.
 Curtis & Curtis, Bridgeport, Conn.
 Jarecki Mfg. Co., Erie, Pa.
 Merrill Mfg. Co., Toledo, O.
 Saunders' Sons, D., Yonkers, N. Y.

Pipe Grips
 Prantley Bros. Co., 44 Barclay, N. Y.

Pipes, Fittings, &c.
 Jarecki Mfg. Co., Erie, Pa.
 McNab & Harlin Mfg. Co., N. Y.

Pipe, Riveted Steel
 Pollock, W. B. Co., Youngstown, O.
 Seaford Wm. B. & Sons, Pittsburgh.

Pipe Unions
 Dart, E. M. Mfg. Co., Providence, R. I.

Pipe, Water and Gas
 Millar, C. & Son Co., Utica, N. Y.
 National Tube Co., Pittsburgh, Pa.
 Reading Fdry. Co., Reading, Pa.
 Red Jacket Mfg. Co., Davenport, Iowa.
 U. S. Cast Iron Pipe & Foundry Co., Phila., Pa.
 Warren City Boiler Works, Warren, O.
 Wood, H. D. & Co., Philadelphia, Pa.

Pistons and Piston Bronze
 Ansonia Brass & Copper Co., 99 John St., N. Y.

Planes
 Stanley Rule & Level Co., N. Y.

Planers
 Amer. Tool Works Co., Cincinnati, O.
 Baird, U. Machinery Co., Pittsburgh, Pa.
 Bement, Miles & Co., Phila., Pa.
 Cincinnati Planer Co., Cincinnati, O.
 Detrick & Harvey Mch. Co., Baltimore.
 Dwyer Mch. Tool Co., Worcester, Mass.
 Niles Tool Works, Hamilton, Ohio.
 Whitcomb Mfg. Co., Worcester, Mass.
 Wilson, W. A., Rochester, N. Y.

Plated Ware
 International Silver Co., Meriden, Ct.
 Myers, S. F. Co., 46-50 Madison Lane, N. Y.

Plates, Iron and Steel
 Danville Bessemer Co., Danville, Pa.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Pine Iron Works Co., Pine Iron Works, Pa.
 Singer, Nimblek & Co., Inc., Pittsburgh, Pa.
 Tidewater Steel Co., Philada., Pa.
 Wood, Alan Co., Philadelphia.

Plate Iron Work
 Seaford Wm. B. & Sons, Pittsburgh.

Pliers
 Bridgeport Mfg. Co., Bridgeport, Conn.
 Morrill, Chas., Broadway and Chambers Sts., N. Y.
 Utica Drop Forge & Tool Co., Utica, N. Y.

Pneumatic Tools
 Chicago Pneumatic Tool Co., Chicago, Phila., Pa.
 Q & C Co., Chicago, Ill.
 Standard Pneumatic Tool Co., Chicago, Ill.

Pocket Knives
 Cattaraugus Cutlery Co., Little Valley, N. Y.
 Northfield Knife Co., Northfield, Conn.

Pokers and Lifters
 Troy Nickel Works, Troy, N. Y.

Polishing Stands
 Ross, Josiah, Buffalo, N. Y.

Polishing Wheels
 Dwyer Mch. Tool Co., Utica, N. Y.

Portable Track
 Atlas Bolt & Screw Co., Cleveland, O.

Post Hole Diggers
 Kohler, F. E. & Co., Canton, O.
 Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Poultry Fencing
 DeKalb Fence Co., DeKalb, Ill.

Poultry Nettings
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 Tyler, W. S. Co., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.

Poultry Netting Display Racks
 Burton, Matthew, Batavia, Ill.

Power Hack Saws
 Hofer Mfg. Co., Freeport, Ill.

Power Hammers
 Beaudry & Co., Boston, Mass.
 Bradley Co., Syracuse, N. Y.
 Dieneit & Eisenhardt, Philadelphia.
 Duquesne Mach. Concern, Duquesne, Pa.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Kidder, R. E., Worcester, Mass.
 Miner & Peck Mfg. Co., New Haven, Ct.
 Scranton & Co., The, New Haven, Conn.

Power Transmitting Mach'y
 Cresson, Geo. V. Co., Phila., Pa.
 Dodge Mfg. Co., Mahawaka, Ind.
 Machinists' Supply Co., Rochester, N. Y.
 Norwalk Iron Wks. Co., So. Norwalk, Ct.

Pressed Metal Work
 Avery Stampings Co., Cleveland, Ohio.

Presses, Power
 Adriance Mach. Works, Brooklyn, N. Y.

Bliss, E. W. Co., Brooklyn, N. Y.
 Cook, T. W. G., 6 Reade St., N. Y.
 Cross & Speirs Mach. Co., Waterbury, Conn.
 Ferracute Mach. Co., Bridgeton, N. J.
 Hillier & Jones Co., Winsted, Conn.
 Keagy & Lear Mch. Co., Cohocton, O.
 Leffer, Chas. & Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Mossberg & Granville Mfg. Co., 1707 Broadway, N. Y.
 Plance, R. L., New Haven, Conn.
 Niagara Machine & Tool Works, Buffalo, Pa.
 Phila. Machine Tool Co., Phila., Pa.
 Rudolph & Krummel, Chicago, Ill.

Projectiles
 National Tube Co., Pittsburgh, Pa.

Proper Wheels
 Truscott Boat Mfg. Co., St. Joseph, Mich.

Pruisers
 Henry, John T. Mfg. Co., Hadden, Ct.

Pulleys
 Amer. Pulley Co., Phila., Pa.
 Dodge Mfg. Co., Mahawaka, Ind.
 Eastern Machinery Co., New Haven, Conn.
 Evans, G. F., Boston, Mass.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Saginaw Mfg. Co., Saginaw, Mich.
 Woods, T. R. Sons, Chambersburg, Pa.

Pump Chains
 Cleveland Galvanizing Works, Cleveland, Ohio.

Pumping Machinery
 Cook, A. D., Lawrenceburg, Ind.
 Dodge Mfg. Co., Mahawaka, Ind.
 Ingersoll-Sergeant Drill Co., 26 Cortlandt St., N. Y.
 McGowan, J. H. & Co., Cincinnati, O.
 Southwark Fdry. & Mch. Co., Philadelphia, Pa.

Pumps
 Athol Pump Co., Athol, Mass.
 Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Edson Mfg. Co., Boston, Mass.
 Flint & Walling Co., Kendallville, Ind.
 H. C. Snyder & Co., Muskegon, O.
 Humphreys Mfg. Co., Mansfield, O.
 Myers, F. E. & Bro., Ashland, Ohio.
 Red Jacket Mfg. Co., Davenport, Ia.
 St. Joseph Pump & Mfg. Co., St. Joseph, Mo.

Punches and Shears, Hand and Power
 Morrill, Chas., Broadway and Chambers Sts., N. Y.

Punching and Shearing
 Harrington & King Perforating Co., Chicago, Ill.

Push Carts
 Syracuse Chilled Plow Co., Syracuse.

Pyrometers
 Chilling, Steinbart & Co., Ltd., Carlstadt, N. J.

Quotation Records
 Globe-Wernicke Co., Cincinnati, Ohio.

Railroads
 C. C. & St. L. R. R., Cincinnati, O.
 Hunt, C. W. Co., West New Brighton, N. Y.

Rat and Mouse Traps
 Burditt & Williams, Boston, Mass.

Razors
 Buck Bros., Milbury, Mass.
 Fox Cutlery Co., Dubuque, Iowa.
 Swedish Razor Co., Worcester, Mass.

Razor Honers
 Pike Mfg. Co., Pike Station, N. H.

Reading Stands
 Aldrich, H. & Co., Miamisburg, O.

Reamers
 Morse Twist Drill & Mch. Co., New Bedford, Mass.

Recording Gages
 Bristol Co., Wat-Runy, Conn.
 Chilling, Steinbart & Co., Ltd., Carlstadt, N. J.

Reels
 Hendryx, A. B. Co., New Haven, Conn.

Refrigerating Machinery
 York & Sons, York, Pa.

Refrigerators
 Maine Mfg. Co., Nashua, N. H.
 Wilke Mfg. Co., Richmond, Ind.

Registers
 Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

Relaying Rails
 Donaldson & Newton, Phila., Pa.
 Isaac Joseph Iron Co., Cincinnati, O.
 May & Spalding, 32 Broadway, N. Y.
 Steel Rail Supply Co., 100 Broadway, N. Y.

Reloading Tools
 Bridgeport Gun Implement Co., 315-317 Broadway, N. Y.
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Repairing Sets, Family
 Star Heel Plate Co., Newark, N. J.

Repair Outfits, Farmers'
 Imperial Bit & Snap Co., Racine, Wis.

Revolution Counters
 Fitch, A. B. Machry. Co., Providence, R. I.

Revolvers
 Tabor Mfg. Co., Elizabeth, N. J.

Revolvers
 Harrington & Richardson Arms Co., Worcester, Mass.
 Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.

Rheostats
 Cutler-Hammer Mfg. Co., Milwaukee, Electric Controller & Supply Co., Cleveland, O.

Rifles
 Marlin Fire Arms Co., New Haven, Ct.
 Remington Arms Co., 315 Broadway, N. Y.

Rivets
 Stevens Arms & Tool Co., Chicopee Falls, Mass.

Rivets
 Phila. Pneumatic Tool Co., Phila., Pa.

- Riveters, Harness**
Orangeville Agl. Works & Foundry, Orangeville, Pa.
- Riveters, Pneumatic**
Chicago Pneumatic Tool Co., Chicago, Ill.
- Rivets**
American Iron & Steel Mfg. Co., Lehigh, Pa.
American Screw Co., Providence, R. I.
Baker & Johnson, Waterville, Conn.
Barden Iron Co., Troy, N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Plymouth Mills, Plymouth, Mass.
Rockford Bolt Works, Rockford, Ill.
Townsend C. & E. P., New Brighton, Pa.
- Riveting Machines**
Bethlehem Foundry & Mch. Co., So. Bethlehem, Pa.
Shuster, F. B. Co., New Haven, Conn.
- Roll Mill Machinery**
Baker & Johnson, Waterville, Conn.
- Roll Turning Tools**
Fitchewy-Sam'l & Co., Ltd., Pittsburgh, Pa.
- Roller Bearings**
Roller Bearing Co., Boston, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
- Rollers**
Whitehurst, R. W. & Co., Norfolk, Va.
Lager, J. K. & Sons, Monroe, Mich.
- Rolling Mill Machinery**
Smith, The Lloyd Co., Youngstown, O.
Farrington, B. M., Pittsburgh, Pa.
Farrell & Fyfe, Mch. Co., Ansonia, Ct.
Frank Kneeland Mach. Co., Pittsburgh, Pa.
Garrison, A. Foundry Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
Penn. Engineering Wks., New Castle, Penna.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel**
Smith, The Lloyd Co., Youngstown, O.
Farrell & Fyfe, Mch. Co., Ansonia, Ct.
Frank Kneeland Mach. Co., Pittsburgh, Pa.
Garrison, A. Foundry Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
Penn. Engineering Wks., New Castle, Penna.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
- Roofing and Siding**
Garry Iron & Steel Roofing Co., Cleveland, O.
Penn Metal Ceiling & Roofing Co., Phila., Pa.
- Rope and Cordage**
American Rope Co., 65 Wall St., N. Y.
Waterbury Rope Co., 65 Wall St., N. Y.
- Rope and Web Goods**
Covett Mfg. Co., West Troy, N. Y.
- Rope Sizing**
Ironides Co., Columbus, Ohio.
- Rope Transmission and Hoisting**
American Wire Works, San Francisco, Cal.
Hunt, C. W. Co., West New Brighton, N. Y.
Lechen, A. & Sons, Rope Co., St. Louis, Mo.
Woods, T. B. Sons, Chambersburg, Pa.
- Rubber Goods**
Boston Belting Co., Boston, Mass.
Canfield, H. O., Bridgeport, Conn.
Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.
- Rules**
Lufkin Rule Co., Saginaw, Mich.
Stanley Rule & Level Co., 29 Chambers St., N. Y.
- Sad Irons**
Williams, A. C., Ravenna, O.
- Sad Iron Handles**
Schrayers, M. Sons & Co., Chicago, Ill.
- Sand Blast Apparatus**
W. V. Edgar T. & Sons, Boston, Mass.
- Sand Paper**
Baeder, Adamson & Co., Phila., Pa.
- Sapphires**
Mason Cutting Factories, 12-15 John St., N. Y.
- Sash Balances**
Caldwell Mfg. Co., Rochester, N. Y.
Putnam Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains**
Bridgeport Chain Co., Bridgeport, Conn.
Morton, Thos., 65 Elizabeth St., N. Y.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.
Smith & Egge Mfg. Co., Bridgeport, Conn.
- Sash Locks**
Smith, W. & E. T. Co., The, New Haven, Conn.
Ives, E. B. & Co., New Haven, Conn.
Greiner, J. L., Chicago, Ill.
- Sash Pulleys**
Fitch Machine Co., Grand Rapids, Mich.
Grand Rapids Hardware Co., Grand Rapids, Mich.
Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights**
Barnes & Reed Mfg. Co., Boston, Mass.
Brown, E. E. & Co., Philadelphia, Pa.
Enterprise Foundry Co., Cincinnati, O.
- Sawage Stuffers**
National Specialty Mfg. Co., Phila., Pa.
- Saws**
Atkins, E. C. & Co., Indianapolis, Ind.
Disston, Henry & Sons, Inc., Phila., Pa.
Morrill, Chas., Broadway and Chambers St., N. Y.
Taintor Mfg. Co., 9 to 15 Murray, N. Y.
- Saw Tools**
Atkins, E. C. & Co., Indianapolis, Ind.
- Scales**
Chattillon, John & Sons, 85-89 Cliff St., N. Y.
Chicago Seal Co., Chicago, Ill.
Pelouse Scale & Mfg. Co., Chicago, Ill.
Reading Hardware Co., Reading, Pa.
Standard Scale & Supply Co., Pittsburgh, Pa.
- Scrap Metals**
Baker, M. J. & M., 10th Ave. and 15th St., N. Y.
Botcher, C., Hoboken, N. J.
Greiner, F., Philadelphia, Pa.
Hittner, H. A. & Sons, Phila., Pa.
Hofelder, Theo. & Co., Buffalo, N. Y.
Leonard, John & Co., Broadway, N. Y.
Miles, E. O. & Co., Atlatan, N. Y.
N. J. Iron & Metal Co., Paterson, N. J.
Perry, Wm. H. Co., Providence, R. I.
Phillips, F. R. & Sons Co., Phila., Pa.
Rogers, W. H., Bridgeport, Conn.
Samuels, M. Sons, Brooklyn, N. Y.
Smith Morton B. Co., New York.
- Scrapers, Road**
American Steel Scraper Co., Sidney, O.
Aultman Co., Canton, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Sidney Steel Scraper Co., Sidney, O.
Syracuse Chilled Plow Co., Syracuse, N. Y.
- Screen, Perforated Metal**
Harrington & King Perforating Co., Chicago, Ill.
- Screen, Window and Door**
Barney, Edw. & Sons, Philadelphia, Pa.
- Screw Cutting Dies**
Card, S. W. Mfg. Co., Mansfield, Mass.
Geometric Drill Co., Westville, Conn.
Rogers, Jno. M. Bolt Gauge & Drill Co., Cincinnati, Ohio.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers**
Brown, H. H. & Co., New Haven, Conn.
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Disston, Henry & Sons, Inc., Phila., Pa.
Gay, Geo. E., Augusta, Me.
Goodell-Pratt Co., Greenfield, Mass.
New England Specialty Co., No. Easton, Mass.
- Screw Machinery**
American Tool Wks. Co., Cincinnati, O.
Baker Bros., Toledo, O.
Brown & Sharpe Mfg. Co., Providence, R. I.
Draper Mach. Tool Co., Worcester, Mass.
Garvin Machine Co., Springfield and Varick Sts., N. Y.
Jones & Lamson Men. Co., Springfield, Vt.
Windsor Mch. Co., Windsor, Vt.
- Screws**
Hall's Sam'l Sons, 229 West 10th St., N. Y.
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.
- Machine**
American Screw Co., Providence, R. I.
Blake & Johnson, Waterville, Conn.
Bowen Mfg. Co., Auburn, N. Y.
Chicago Screw Co., Chicago, Ill.
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.
Holcomb, Harvey, Bridgeport, Conn.
Miles, F. S., 235 Quarry, Philadelphia, Pa.
Phila. Mach. Screw Works, Phila., Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
- Rhode Island Tool Co., Providence, R. I.**
Worcester Mch. Screw Co., Worcester, Mass.
- Wood**
American Screw Co., Providence, R. I.
Franklin Moore Co., Winsted, Conn.
- Scroll Saws**
Barnes, Wm. & John Co., Rockford, Ill.
Hick, Mfg. Co., 28 Warren St., N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Seythe Stones and Whetstones**
Cleveland Stone Co., Cleveland, O.
Pike Mfg. Co., Pike Station, N. H.
- Seamless Steel Tubes**
Janney, Steinmetz & Co., Phila., Pa.
National Tube Co., Pittsburgh, Pa.
- Sewing Machines**
National Sewing Machine Co., Belvidere, Ill.
- Shaft Couplings**
Fairbanks Co., 11 Broadway, N. Y.
- Shafting**
American Steel & Wire Co., Chicago, Ill.
Crescent, Geo. V. Co., Philadelphia, Pa.
Dece Mfg. Co., Mishawaka, Ind.
Fairmount Mch. Co., Philadelphia, Pa.
Finished Steel Co., Youngstown, O.
Jones & Laughlin Co., Pittsburgh, Pa.
Pittsburgh Steel Shafting Co., Rankin, Pa.
- Stow Mfg. Co., Binghamton, N. Y.**
Woods, T. B. Sons, Chambersburg, Pa.
- Shaped Iron and Steel**
Allentown Rolling Mill, Allentown, Pa.
American Steel Hoop Co., Pittsburgh, Pa.
- Forest City Steel & Iron Co., Cleveland, Ohio.**
Lindsay, W. W. & Co., Phila., Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
- National Steel Co., Bridgeport, O.**
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Phila., Pa.
Pittsburgh Steel Shafting Co., Rankin, Pa.
- Republic Iron & Steel Co., Chicago, Ill.**
Roberts, A. & P. Co., Phila., Pa.
- Shapers**
Barker-Charl Mach. Tool Co., Cincinnati, O.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Eberhardt, Newark, N. J.
Potter & Johnston Co., Pawtucket, R. I.
- Shear Knives**
Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.
Tretlowey, Sam'l & Co., Ltd., Pittsburgh, Pa.
- Shears and Scissors**
Acme Shear Co., Bridgeport, Conn.
Cattaraugus Cutlery Co., Little Valley, N. Y.
Heinrich, H. Sons Co., Newark, N. J.
Henson Iron Co., Phila., Pa.
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.
- Shears, Metal**
Carlin's, Thomas Sons Co., Allegheny, Pa.
- Sheet Bars**
National Steel Co., Battery Park Building, N. Y.
- Sheet and Bolt Copper**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Sheet and Rolled Brass**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Sheet Metal Machinery**
Adriance Mach. Works, Brooklyn, N. Y.
- Sheets, Galvanized**
American Sheet Steel Co., New York.
McCullough Iron Co., Wilmington, Del.
- Sheets, Iron and Steel**
American Sheet Steel Co., New York.
Coshocton Rolling Mill Co., Coshocton, O.
- McCullough Iron Co., Wilmington, Del.**
National Steel Co., Bridgeport, O.
Republic Iron & Steel Co., Chicago, Ill.
Singer, Nimick & Co., Inc., Pittsburgh, Pa.
- Water, L. & R. Co., Philadelphia, Pa.**
Alan Wood Co., Philadelphia, Pa.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc**
Illinois Zinc Co., Peru, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Boxes**
Heller Box Co., Montclair, N. J.
Moore, C. F., Ravenswood, W. Va.
- Shelf Ladders**
Huckle Stop Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
- Shovel, Spades and Scoops**
New Castle Shovel Co., New Castle, Pa.
St. Louis Shovel Co., St. Louis, Mo.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
- Sinks**
Kilbourne & Jacobs Mfg. Co., Columbus, O.
- Skates, Ice**
Dane, Stoddard & Co., Boston, Mass.
- Skates, Roller**
Union Hardware Co., Torrington, Conn.
- Skate Sharpeners**
Osborn Mfg. Co., Cleveland, O.
- Skylights**
Drouve, G. Co., Bridgeport, Conn.
- Slaw Cutters**
Disston, Henry & Sons, Inc., Phila., Pa.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
- Smelting Works**
Reeves, Paul S., 760 S. Broad, Phila.
- Soapstone Goods**
Pike Mfg. Co., Pike Station, N. H.
- Soapstone Pencils**
Steward, D. M. Mfg. Co., Chattanooga, Tenn.
- Soldering Copper Handles**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Soldering Coppers**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Speaking Tubes**
Gardner, W. R. & Co., 304 Fulton St., N. Y.
- Specialty Manufacturers**
Franklin, H. H. Mfg. Co., Syracuse, N. Y.
Smith & Egge Mfg. Co., Bridgeport, Ct.
- Spelter**
Illinois Zinc Co., Peru, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Penna. Smelting Co., Pittsburgh, Pa.
- Spelter Solder**
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Spikes**
American Iron & Steel Mfg. Co., Lehigh, Pa.
- Spoons and Forks**
International Silver Co., Meriden, Ct.
- Sporting Goods**
Dane, Stoddard & Co., Boston, Mass.
- Sprayers**
Smith, D. B. & Co., Utica, N. Y.
- Spray Pumps—(See Pumps)**
- Springs**
American Steel & Wire Co., Chicago, Ill.
Parne, Wallace Co., Bristol, Conn.
Chattillon, John & Sons, 85-89 Cliff St., New York.
- Clark & Cowles, Plainville, Conn.**
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.
Scott, Chas. Spring Co., Phila., Pa.
St. Johns Spring Co., St. Johns, Mich.
Welch, T. F. Mfg. Co., Boston, Mass.
- Springs, Wagon, Etc.**
Wurster, F. W. & Co., Brooklyn, N. Y.
- Spring Cutters**
Brooks, M. S. & Sons, Chester, Conn.
Ho. Inger Fence Co., Greenville, O.
- Spring Hinges**
Bommer Bros., Brooklyn, N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Coleman Hdw. Co., Chicago, Ill.
Stover Mfg. Co., Freeport, N. Y.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
- Stamps**
Scale, Wm. B. & Sons, Pittsburgh.
- Stamped Ware**
Jenkinson, R. C. & Co., Newark, N. J.
Keen & Hagerty, Mfg. Co., Baltimore, Md.
New York Stamping Co., Brooklyn, N. Y.
- Stamping, Sheet Metal**
American Hdw. Mfg. Co., Ottawa, Ill.
American Railway Supply Co., 24 Park Place, N. Y.
American Steel Scraper Co., Sidney, O.
- Clay Stamping Co., Cleveland, Ohio.**
Cleveland Stamping & Tool Co., Cleveland, Ohio.
Davis & Buxton Stamping Co., Worcester, Mass.
Goodwin & Kintz Co., Winsted, Conn.
Houghton & Buxton Mfg. Co., Worcester, Mass.
Jenkinson, R. C. & Co., Newark, N. J.
Kontschow, E. & Bro., Cleveland, Ohio.
Mossler, Frank Co., Attleboro, Mass.
Wheeling Hinge Co., Wheeling, W. Va.
- Staples and Double Pointed Tacks**
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
Titcheener, E. H. & Co., Binghamton, N. Y.
- Steam Hammers, &c.**
Dienelt & Eisenhardt, Philadelphia.
Hudson, Richard, 24 Columbia St., N. Y.
Sellers, Wm. & Co., Inc., Phila., Pa.
- Steam Heating**
Webster, Warren & Co., Camden, N. J.
- Steam Rollers**
Kelly, The O. S. Co., Springfield, O.
- Steam Separators**
Harrison Safety Roller Wks., Phila., Pa.
Webster, Warren & Co., Camden.
- Steam Specialties**
Crosby Steam Gauge & Valve Co., Boston.
Lunkenheimer Co., Cincinnati, O.
Mason Regulator Co., Boston, Mass.
- Steel Balls**
Cleveland Ball & Screw Co., Cleveland, Ohio.
- Steel Buildings**
Berlin Iron Bridge Co., East Berlin, Ct.
Boston Bridge Works, Boston, Mass.
New England Structural Co., Boston, Mass.
- Ritter-Conley Mfg. Co., Pittsburgh, Pa.**
Scaife, Wm. B. & Sons, Pittsburgh, Pa.
- Steel, Cold Rolled Strip**
American Bicycle Mfg. Co., So. Chicago, Ill.
Wilmut & Hobbs Mfg. Co., Bridgeport, W. Va.
- Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.**
- Steel Forgings and Castings**
Bethlehem Steel Co., So. Bethlehem, Pa.
- Steel Hoops**
American Steel Hoop Co., Pittsburgh, Pa.
- Steel Importers**
Hobson, Houghton & Co., 98 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John St., N. Y.
Milne, A. & Co., Broadway, N. Y.
Wheelock, Lovejoy & Co., New York and Boston.
- Steel (Mushet's Special)**
Jones, B. M. & Co., Boston.
- Steel Manufacturers**
Allegheny Steel Co., Pittsburgh, Pa.
American Bicycle Mfg. Co., So. Chicago, Ill.
American Steel Hoop Co., Pittsburgh, Pa.
Ashland Steel Co., Ashland, Ky.
Baker, Hermann & Co., 103 Duane St., New York.
Braeburn Steel Co., Braeburn, Pa.
Champion Iron & Steel Co., Muskegon, Mich.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Danville Bessemer Co., Danville, Pa.
Frankford Steel Co., Philadelphia.
Heckert-Baltzell Billet Co., Toledo, O.
Hobson, Houghton & Co., 98 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John St., New York.
Jones & Laughlin, Ltd., Pittsburgh, Pa.
Kidd Bros. & Burkner Steel Wire Co., McKees Rocks, Pa.
La Belle Steel Co., Pittsburgh, Pa.
Lorain Steel Co., Lorain, Ohio.
Lukens Iron & Steel Co., Coatesville, Pa.
Nash, Geo. & Co., Chicago.
National Steel Co., Battery Park Building, N. Y.
Newkirk, J. B. & Co., Philadelphia, Pa.
Otis Steel Co., Ltd., Cleveland, Ohio.
Republic Iron & Steel Co., Chicago, Ill.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Inc., Pittsburgh.
Tidewater Steel Co., Phila., Pa.
Wardlow, S. & C., Sheffield, England.
Wilmut & Hobbs Mfg. Co., Bridgeport.
- Manufacturers' Agents**
Ogden & Wallace, 577-583 Greenwich St., New York.
Snyder, W. P. & Co., Pittsburgh, Pa.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Virginia Iron, Coal and Coke Co., Bristol, Va.
- Steel, Self Hardening**
Denman & Davis, 85-87 John St., N. Y.
- Steel Rails**
Lorain Steel Co., Lorain, Ohio.
- Steel Stamps and Stencil Dies**
Eucker, L. A. Stamp Wks., Little Ferry, N. J.
Ness, Geo. M., Jr., 61 Fulton St., N. Y.
Schwerdtle & Siebert, Bridgeport, Conn.
- Steel, Tool**
Braeburn Steel Co., Braeburn, Pa.
Crescent Steel Co., Pittsburgh, Pa.
Denman & Davis, 85-87 John St., N. Y.
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, or 91 John St., N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
Nash, Geo. & Co., Chicago.
Singer, Nimick & Co., Pittsburgh, Pa.
- Step Ladders**
Handy Ladder Works, Cleveland, O.
Udell Works, Indianapolis, Ind.
- Step Ladders, Rolling**
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Milbradt, G. A. & Co., St. Louis, Mo.
Morley Bros., Saginaw, Mich.
Portland Ladder Co., Newark, N. J.

Stocks and Dies

Armstrong Mfg. Co., Bridgeport, Conn.
Card, S. W. Mfg. Co., Mansfield, Mass.
Curts & Curts, Bridgeport, Conn.
Fathbanks Co., 311 Broadway, N. Y.
Hollands Mfg. Co., Erie, Pa.
Jones & Lauson Mfg. Co., Springfield, Vt.
Jareck Mfg. Co., Erie, Pa.
Oster Mfg. Co., Cleveland, Ohio.
Saunders' son & Co., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield.

Stock Waterers

Reimers, J. N. & Co., Davenport, Iowa.
Ideal Fuel Feeders Co., 31 Burling Slip, N. Y.

Stone Cutting Machinery

Gilman, J. Bennett Bldg., N. Y.

Stone Working Machinery

Pathe, F. H. Mfg. Co., Rutland, Vt.

Store Fixtures

Watson, J. H. Mfg. Co., Chicago, Ill.

Store Hardware

Troy Metal Works, Troy, N. Y.

Store Linings

Strander Fire Brick Co., Troy, N. Y.

Store Pipe Fittings

Cheney, S. & Son, Manlius, N. Y.

Stoves, Oil, Vapor and Gasoline

Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trencamp Co., Cleveland, Ohio.

Stove Trucks

Gibbs, S. & Co., Boston, Mass.

Structural Iron Work

Belmont Iron Works, Falla, Pa.
Berlin Iron Bridge Co., E. Berlin, Conn.
Boston Bridge Works, Boston, Mass.
Forest City Steel & Iron Co., Cleveland, Ohio.
Illinois Steel Co., Chicago, Ill.
Moseley Iron Bridge & Roof Co., 39 Cortland St., N. Y.
New England Structural Co., Boston, Mass.

Structural Ties

Starter Bridge Co., Pittsburgh, Pa.
Stewart Iron Works, Cincinnati, Ohio.
West Side Foundry Co., Troy, N. Y.

Subsidiary Acid

Murphy & Co., Erie, Pa.

Swaging Machines

Excelsior Needle Co., Torrington, Ct.

Table Ware

International Silver Co., Meriden, Ct.

Tack Claws

Mayhew, H. H. Co., Shelburne Falls, Mass.

Tacks, Brads, &c.

Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Cross, Ind. Ill.
Milwaukee Tack Co., Milwaukee, Wis.
Plymouth Mills, Plymouth, Mass.
Empire & Bardett, Plymouth, Mass.
Shelton Co., Birmingham, Conn.
Stanley, G. W. Co., Belleville, Ill.

Tack and Nail Machinery

Kimball Bros. & Sprague, Brooklyn, N. Y.
Perkins, Henry, Bridgeport, Mass.
Sawyer, W. A., Brockton, Mass.

Tanks, Iron and Steel

Seafie, Wm. B. & Sons, Pittsburgh.

Tapes

Lufkin Rule Co., Saginaw, Mich.

Tap Holders

Ideal Machine Works, Hartford, Conn.

Tapping Machines

John Bell, Harper, Bridgeport, Conn.

Taps and Dies

Lesley, C. H. & Co., Chicago, Ill.
Butterfield & Co., Derby Line, Vt.
Card, S. W. Mfg. Co., Mansfield, Mass.
Greene, E. F. Co., Greenfield, Mass.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield.

Tea and Coffee Pots

Rome Mfg. Co., Rome, N. Y.

Tea Kettles

Rome Mfg. Co., Rome, N. Y.

Telephones

Mann Electric Co., Manns, Conn.
Ransom Electric Co., Elkhart, Ohio.

Terne Plate

American Tin Plate Co., N. Y.

Time Recorders

Chicago Time Recorder Co., Chicago, Ill.
Nanz, C. & Co., 15 Duane St., N. Y.
Simplex Time Recorder Co., Gardner, Mass.

Tin Mills

Philadelphia Roll & Mfg. Co., Phila., Pa.
Phillips, F. R. & Sons Co., Phila., Pa.

Timbers' Tools and Machines

Nagars Machine & Tool Works, Buffalo.

Tin Plate

American Tin Plate Co., N. Y.

Tin Plate Machinery

McNab & Co., Inc., Philadelphia, Pa.

Tinware

Looy Bldg. Co., Youngstown, Ohio.

Tinware

Koen & Hagerly, Baltimore, Md.

Tire Fluid

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

To in Bronze

Ansley Bros. & Copper Co., 99 John St., N. Y.

Toe Calks, Steel

Curry, J. F., Boston, Mass.

Toe Calks, Rubber

Curry, J. F., Boston, Mass.

Tool Chests

Am. Tool Chest Co., 200 W. Houston St., New York.

Tools, H. H. Co.

Bliss, H. H. Co., Pawtucket, R. I.

Tool Grinders

Sellers, Wm. & Co., Inc., Phila., Pa.
Union Mfg. Co., Buffalo, N. Y.

Tools

Athol Machine Co., Athol, Mass.

Brumfield-Muelner Co., Elizabeth, N. J.

Brown, R. H. & Co., New Haven, Conn.

Fray, Jno. S. & Co., Bridgeport, Conn.

Gondell Pratt Co., Greenfield, Mass.

Mayhew, H. H. Co., Shelburne Falls, Mass.

Millers Falls Co., 28 Warren St., N. Y.

Myers, S. F. Co., 48-50 Maiden Lane, N. Y.

Springfield Machine Screw Co., Springfield, Mass.

Stanley Rule & Level Co., 29 Chambers St., New York.

Starrett, L. S. Co., Athol, Mass.

Stevens, J., Arms & Tool Co., Chicopee.

Tower & Lyon, 35 Chambers St., N. Y.

Tools, Blacksmith and Wheelwright

Champion Blower & Forge Co., Lancaster, Pa.

Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters'

Saunders' sons, D., Yonkers, N. Y.

Torches, Oil and Gasoline

Schneider & Trencamp Co., Cleveland, O.

Tote Boxes

Clark, W. J. & Co., Salem, O.

Toys, Iron

Coleman Hardware Co., Chicago, Ill.

Traction Openers

Ormsby, S. A., Melrose, Mass.

Traps, Animal

Hawkins Co., Waterbury, Conn.

Traps, Gun

Hartman Mfg. Co., 309 Broadway, N. Y.

Trimmers

American Mach'y Co., Grand Rapids, Mich.

Trolleys

Boyd, Alfred & Co., Philadelphia, Pa.

Trowels

Bishop, Geo. H. & Co., Cincinnati, O.

National Saw Co., Newark, N. J.

Trunks

Boston & Lockport Black Co., Lockport, N. Y.

Fathbanks Co., 31 Broadway, N. Y.

Kilbarn & Jacobs Mfg. Co., Columbus, Mich.

Lansing Wheelbarrow Co., Lansing, Mich.

Syracuse Chilled Plow Co., Syracuse, N. Y.

Tub Hoops

Outman Bros., Medina, Ohio.

Tubes, Seamless Drawn Copper, Brass and Bronze

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Randolph Clowes Co., Waterbury, Conn.

Tubing, Brass

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Phoenix Tube Co., Brooklyn, N. Y.

Sanford, W. S. & Son, Providence, R. I.

Phenix Tube Co., Brooklyn, N. Y.

Tubing, Steel

Best Transmission Co., Danbury, Ct.

Heckert-Baltzer Billet Co., Toledo, O.

Janney, Steinmetz & Co., Phila., Pa.

Levy's John & Son & Co., 411 Center St., National Tube Co., Pittsburgh, Pa.

Shelby Steel Tube Co., Cleveland, O.

Starter-Bischoff Co., Chicago, Ill.

Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.

Turnbuckles

Cleveland City Forge & Iron Co., Cleveland, O.

Merill Bros., 463 Kent Ave., Brooklyn, N. Y.

Twist Drills

Cleveland Twist Drill Co., Cleveland, O.

Graham, John H. & Co., 113 Chambers St., N. Y.

Morse Twist Drill & Machine Co., New Bedford, Mass.

New Process Twist Drill Co., Taunton, Mass.

Slocumb, J. T. & Co., Providence, R. I.

Standard Tool Co., Cleveland, O.

Twist Drill Grinders

Fulter Mfg. Co., Salamanca, Mich.

Heald, L. S. & Son, Barre, Mass.

Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.

Typewriters

Wickoff, Seamans & Benedict, 32 Broadway, N. Y.

Unions, Brass

Solte Bros. Co., Springfield, Ohio.

Upholsterers' Hardware

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Valve Remodeling Device

Quincy Valve & Mfg. Co., Quincy, Ill.

Valves, Gas, Water and Steam

Ashton Valve Co., Boston, Mass.

Chapman Valve Mfg. Co., Boston.

Crosby Steam Gate Valve Co., Boston.

Jeandine Bros., 21 John, N. Y.

Kennedy Valve Mfg. Co., 75 John St., N. Y.

Lunkenheimer Co., Cincinnati, Ohio.

McNab & Co., 36 John, N. Y.

Mason Regulator Co., Boston, Mass.

Roading Fdry. Co., Reading, Pa.

Wood, R. D. & Co., Philadelphia, Pa.

Varnish

Standard Varnish Works, 23 Broadway, N. Y.

Vegetable Fibers

Streeter, N. H. & Co., Rochester, N. Y.

Ventilating Fans

American Glower Co., Detroit, Mich.

Bayley, Wm. & Sons Co., Milwaukee, Wis.

Boston Blower Co., Hyde Park, Mass.

Buffalo Forge Co., Buffalo, N. Y.

Exeter Machine Wks., Boston, Mass.

Perkins, B. F. & Son, Holyoke, Mass.

Ventilating System

Ormsby, S. A., Melrose, Mass.

Ventilator Appliances

Howard & Morse, 45 Fulton St., N. Y.

Ventilators

Innovative Co., Bridgeport, Conn.

Merchant & Co., Inc., Philadelphia, Pa.

Ventilator Openers

Ormsby, S. A., Melrose, Mass.

Vises

Athol Machine Co., Athol, Mass.

Bliss & Keeler Mfg. Co., Edwardsville, Ill.

Holan Mfg. Co., Erie, Pa.

Howard Iron Works, Buffalo, N. Y.

Lewis Tool Co., 44 Barclay St., N. Y.

Massey Vise Co., Chicago, Ill.

Parsons, Chas. Co., Meriden, Conn.

Prentiss Vise Co., 44 Barclay, N. Y.

Tower & Lyon, 35 Chambers St., N. Y.

Utica Drop Forge & Tool Co., Utica, N. Y.

Wagon Jacks

Covert Mfg. Co., West Troy, N. Y.

Cov. R's saddle Works, Farmer, N. Y.

Lane Bros. Co., Poughkeepsie, N. Y.

Washers

Hall, Sam'l Sons 229 West 10th St., N. Y.

Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

Nut & Washer Mfg. Co., Milwaukee, Wis.

Washers & Smith, Worcester, Mass.

Washers, Lead

Hildreth Bros., Cincinnati, Ohio.

Milton Mfg. Co., Milton, Pa.

Washing Machines

Benbow Mfg. Co., St. Louis, Mo.

Bass Washing Mch. Co., Cincinnati, O.

Chapman, H. F. Mfg. Co., Davenport, Ia.

Clark, Quen & More, Peoria, Ill.

Funk Co., Rock Falls, Ill.

Famous Mfg. Co., Chicago, Ill.

Horton Mfg. Co., Fort Wayne, Ind.

Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

Watches

Wells, S. F. Co., 48-50 Maiden Lane, N. Y.

Water Man's Locks

Nant, C. & Co., 15 Duane St., N. Y.

Water Gates

Kennedy Valve Mfg. Co., 75 John St., N. Y.

Water Wheels

Don, J. & Son Co., Baltimore, Md.

Hook, A. O., Lawrenceburg, Ind.

Wheelbarrows

American Steel & Scrap Co., Sidney, O.

Brass & Copper Co., 121 Worth St., N. Y.

Kilbarn & Jacobs Mfg. Co., Columbus, Mich.

Lansing Wheelbarrow Co., Lansing, Mich.

Syracuse Chilled Plow Co., Syracuse, N. Y.

Wheels, Steel

Wheeler Metal Wheel Co., Havana, Ill.

Wind Mills

Wint & Walling Co., Kendallville, Ind.

Window Cord

Wagon Cordage Works, Boston, Mass.

Window Fasteners

Stanley Works, New Britain, Conn.

Window Guards

Most of the best for the least.
IVER JOHNSON BICYCLES.

\$15.00

SAVED BY
Buying an **IVER JOHNSON**
BICYCLE
An **HONEST WHEEL**
at an **HONEST PRICE**

\$35 **HIGH GRADE** **\$25** **MEDIUM GRADE**
RACERS
\$50 **\$45** **\$60**
Cushion Frame Bicycles **Chainless Models**

PRICES ARE EASY TO QUOTE. QUALITY TELLS THE TALE.

WE INVITE YOUR MOST CRITICAL EXAMINATION.
Send for Catalogue.

Branches:
NEW YORK,
BOSTON,
WORCESTER.

Iver Johnson's Arms & Cycle Works,
FITCHBURG, MASS.

Republic Iron & Steel Company

GENERAL OFFICES: Stock Exchange Building, Chicago, Ill.

—MANUFACTURERS—

BAR IRON:

Common, Refined and B. B. Iron,
Flats, Rounds, Squares, Ovals, Etc.
Chain and Rivet Iron,
Maud S. Horse Shoe Bar,
Skelp Iron, Etc.

BAR STEEL:

Bessemer and Open Hearth,
Flats, Rounds, Squares, Ovals,
Angles, Channels, Special Shapes,
Round Edge Steel Tire,
Agricultural Shapes, Etc.

PLATES and Angles, Turnbuckles,
"T" Rails, 8 to 20 lbs.,
Cold Rolled Steel, Cut Nails.

SHEETS (Black and Galvanized).
Harrow Teeth, Bolts and Nuts.

R. R. SPIKES, Steel Fence Posts,
Steel Whiffletrees,
Cross Arm Braces and Pole Steps.

FOUNDRY, BESSEMER AND MILL PIG IRON.

DISTRICT SALES OFFICES:

Ellicott Square, Buffalo, N. Y. Manhattan Life Bldg., New York.
Perry-Payne Bldg., Cleveland, O. Mermod-Jaccard Bldg., St. Louis.
Birmingham, Ala. Cincinnati, Ohio.
Endicott Arcade, St. Paul, Minn.

Hardware Store Business Methods.

A book describing advanced and effective business methods, and full of practical suggestions, information and facts for **Merchants, Buyers, Salesmen, Clerks and Accountants.**

A practical guide for the hardwareman in matters of business, and a valuable aid to the clerk in qualifying for a successful career.

200 Pages, Octavo, Cloth.

ONE DOLLAR, POSTPAID.

DAVID WILLIAMS COMPANY, Publishers,

232-238 William Street, New York.

ROBT. WETHERILL & Co.,

CHESTER, PA.

Manufacturers

CORLISS ENGINES

Berry Safety

BOILERS.

CLARK & PARSONS CO.,

EAST WILTON, MAINE, U. S. A.

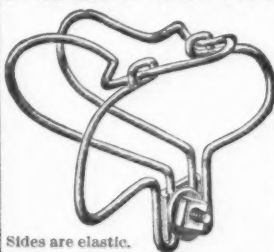
New Line

Hay Corn Bread KNIVES.

Send for Circulars.

WIEBUSCH & HILGER, Ltd., N. Y.
Sole Agents for U. S. and Canada.

FREE SAMPLE pair



"Ashworth"
Patent Toe
Clips to deal-
ers. Send 5
cents to pay
postage.
Price, \$1.00
per dozen
pairs.

Sides are elastic.

L. T. SNOW, Manufacturer,
New Haven, Conn., U. S. A.

J. T. WHERETT, 35 Warren St., N. Y., Agent.

BICYCLE

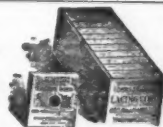
Dress Guard Lacing
and Nets

BRIGHT WIRE GOODS

Send for Prices.

Ossawan Mills Co., Norwich, Conn

P.O. Box
531.



BRADLEY STEEL BRACKETS

Have a relatively small amount of metal
in their construction.

THE ADVANCE IN PRICE

is consequently small

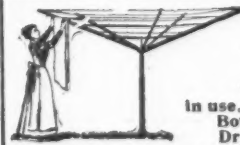
Strong, Light and Alright.

ATLAS MFG. CO., New Haven, Ct., U.S.A.

Hill Clothes Dryer.

More than

100,000



in use, pleasing everybody.
Both yard and balcony
Dryers.

Fold them up without removing clothes-line and
take indoors when not in use.

Ask your Hardware dealer about them or send for Il-
lustrated Catalogue giving full description and prices.
HILL DRYER COMPANY, Worcester, Mass.

FITCH SASH LOCKS

Send for
Catalog



SATISFY

**BUILDERS,
USERS,
DEALERS.**

MANUFACTURED BY
THE W. & E. T. FITCH CO., New Haven, Ct.

For
Manganese Bronze
and
Phosphor Bronze
apply to
Paul S. Reeves & Son
Philadelphia, Pa.
Marine work a speciality

AMERICA'S BEST.
BUFFALO FORGES
Stationary and Portable.


The Down Draft Smoke Exhaust Types afford pure air in blacksmith shops.
Buffalo Forge Co., Buffalo, N. Y., U. S. A.
THE WORLD'S STANDARD.

STEEL TUBES
WELDLESS
COLD DRAWN
SMOOTH INSIDE AND OUT
JOHN S. LENG'S SON & CO. NEW YORK.

Metal Polish.

The Tanite Co.,
Stroudsburg, Pa.

MILLER & VAN WINKLE
STEEL WIRE AND STEEL SPRINGS
TEMPERED COMPRESSION & EXTENSION SPRINGS
A SPECIALTY.
MACHINE SPRINGS
ICE & WORKS 110 to 124 BRIDGE ST. BROOKLYN, N. Y.

UTICA PIPE FOUNDRY CO.


Best Iron Pipe for Water or Gas. CHAS. MILLAR & SON CO., Utica, N. Y., Selling Agents. Also Flanged Pipe, Lead Pipe and Plumbing Materials.

SPENCER AUTOMATIC MACHINE SCREW CO.


WHITEFORD & SONS
HARTFORD, CONN.

BOMMER SPRING HINGES
ARE THE BEST.
"PRACTICALLY UNBREAKABLE"
SAYS THE WORLD'S FAIR AWARD
BOMMER BROTHERS,
Factory, 257-271 Classon Ave.,
BROOKLYN, N. Y.

STANLEY G. FLAGG & CO., Philadelphia, Pa.
Office and Wks., N. W. Cor. 19th St. & Pennsylvania Ave.
Manufacturers of **STEEL CASTINGS**,
A Substitute for Steel and Wrought Forgings.
Circulars Sent on Application.

Power Hack Saw.
See Page 120

MILLERS FALLS CO.,
28 Warren St., New York.

Springs and Axles
ROLLING MILL.
F. W. Wurster & Co.,
375 Kent Ave., - Brooklyn, N. Y.
Fine Taps, Dies and Reamers.




Lightning and Green River Screw Plates, Bolt Cutters, Hand and Power Drilling Machines, Punching Presses, Tire Benders, Tire Upsetters and other Labor Saving Tools. Send for New Catalogue.
WILEY & RUSSELL MFG. CO., Greenfield, Mass.

LIDGERWOOD
HOISTING ENGINES.
The STANDARD For QUALITY and DUTY.
LIDGERWOOD MFG. CO., 96 Liberty St., N. Y.

ESTABLISHED
Spring Making, 1842. Steel Making, 1845.
Norway Iron, 1871 (Re-Rolled).

WM. & HARVEY ROWLAND,
MANUFACTURERS OF
Springs, Steel, Re-Rolled Norway
Iron & Silt Norway Nail Rods.
Address FRANKFORD P. O., PHILADELPHIA.

CAREFUL INDEX WHEELS 98" DIAM. & SMALLER
SPACING

GLEASON TOOL CO.
ROCHESTER, N. Y.

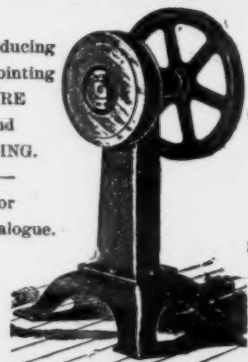
BESIDES "KENNEDY" GATES
WE MAKE
GLOBE, ANGLE
and RADIATOR
ALSO
SWING CHECK
VALVES.
All of a superior quality.
THE KENNEDY VALVE MFG. CO.,
58 Beekman St., New York.

"PERFECTION" we named this faucet
As its quality is so good;
Its finish is fine, and every part
Is of selected CEDAR wood.
JOHN SOMMER'S SON,
355-365 CENTRAL AVE.
NEWARK, N. J.

Dayton Swaging Machine

for reducing
and pointing
WIRE
and
TURNING.

Send for
Catalogue.



Tapering
and
Pointing
and all kinds
of
Reducing
Also Man-
ufacturers
of
SPOKES
and
NIPPLES

EXCELSIOR NEEDLE CO., Torrington, Conn.


CALIPERS
CHARLES H. BESLY & CO.
FINE TOOLS & SUPPLIES FOR METAL WORKERS
10 & 12 N. CANAL ST. CHICAGO, ILL. U.S.A.
SEND FOR 200 PAGE CATALOGUE

CHAIN HOISTS
HAND
PNEUMATIC, ELECTRIC
CRANES
HISHOLM & MOORE MFG. CO.
CLEVELAND, O.

Twenty Years
of Success!

GEM
SPRING
HINGES.

Write for our catalogue.

Van Wagoner & Williams
Hardware Co.,

Cleveland, O., and New York, U. S. A.

ine

ering
and
enting
all kin
of
icing
Mam
urere
of
ES
ed
PPLE

con

D.
&



Supplement to THE IRON AGE, May 3, 1900

THE IRON AGE

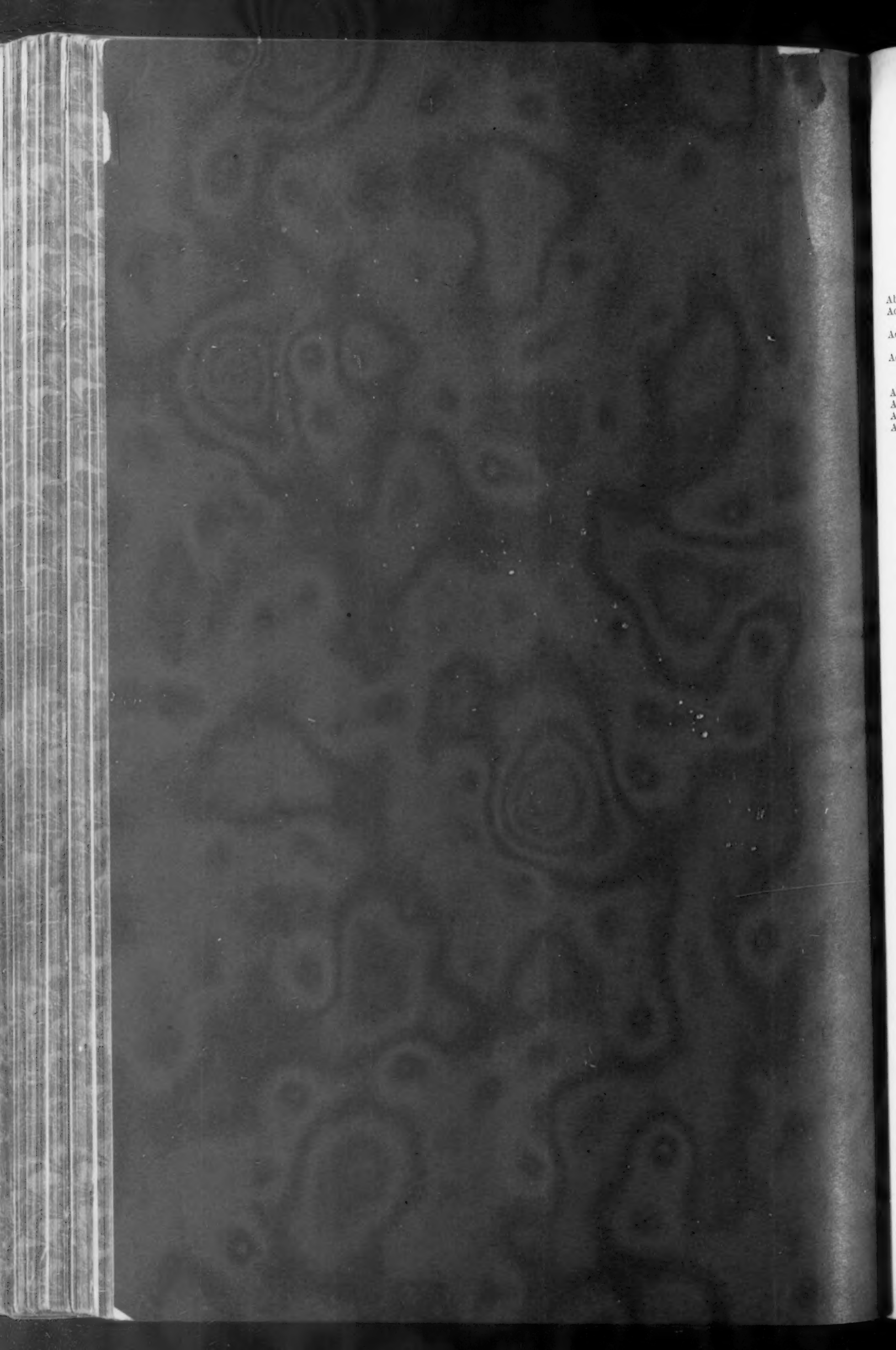
INDEX

SUPPLEMENT

429709

MAY 4 1900

NEW YORK—232-235 William Street
PHILADELPHIA—412-419 So. 4th Street
PITTSBURGH—509 Hamilton Building
CHICAGO—1205 Fisher Building
CINCINNATI—23-24 Piquette Building
BOSTON—33 Main Building
CLEVELAND—413 The Cayahoga
ST. LOUIS—1205 Chemical Building



INDEX TO READING MATTER.

VOLUME LXIV.

Illustrated articles indicated by *.

A.

Abner acetylene generator, Oct 5, p 5*
 Acetylene Association, International, July 20, p 13
 Acetylene burners, Drake adjustable, Nov 23, p 64*
 Acetylene generators:
 Abner, Oct 5, p 5*
 Coleman, July 13, p 44*
 Acetylene lighting, Nov 30, p 21
 Addyston Pipe Trust case, Dec 7, p 35
 Admiralty Board proposed, July 27, p 16
 Advertising:
 Brown, G. W., Jr., Aug 31, p 34
 Bush advertisement, Aug 3, p 41*
 Crist, R. G., Indiana, July 6, p 36
 Expert criticism of hardware advertisement, Oct 12, p 38; Nov 9, p 45; Nov 23, p 41
 Hardware display figures, July 20, p 40*
 Hints on good advertising, July 27, p 40
Iron Age prize competition, No. 1, July 6, p 37; July 13, p 40; July 20, p 39; Aug 3, p 42; Aug 10, p 38; Aug 17, p 34; Sep 14, p 39
Iron Age prize competition, No. 2, Aug 17, p 35; Sep 7, p 39; Oct 5, p 40*; Oct 19, p 44
 Maine, a float, Oct 5, p 39*
 Miller & Son, Springfield, Ill., July 13, p 37
 New England advertiser, Dec 14, p 43
 Newspaper advertising, Nov 23, p 39
 Novel methods, Nov 9, p 44
 Profitable advertising, Sep 7, p 38; Sep 14, p 38; Sep 21, p 38; Sep 28, p 38; Oct 12, p 39; Oct 19, p 44; Oct 26, p 41; Nov 9, p 46; Nov 16, p 46; Nov 23, p 39
 Sidewalk display, July 27, p 39
 Southern merchant's methods, Dec 28, p 38*
 Trade pamphlet, Dec 28, p 39*
 Window decorations, Aug 10, p 37*; Dec 28, p 39
 Advertising cuts:
 Animal traps, Dec 7, p 45*
 Axes and grindstone, July 13, p 36*; July 27, p 39*
 Bird cages, Oct 19, p 46*
 Christmas announcements, Dec 14, p 42*
 Close buyer, July 20, p 39*
 Corn knives and shellers, Aug 17, p 33*
 Cost and use of cuts, Sep 21, p 38
 Cutlery and silverware, Aug 10, p 38*; Oct 19, p 45*
 Dog collars, Dec 7, p 45*
 Expert criticism of cuts, Oct 26, p 41
 Fall opening in prospect, Oct 5, p 41*
 Farriers' tools, Dec 14, p 43*
 Fire arms, Aug 17, p 33*; Sep 21, p 39*; Oct 19, p 45*; Dec 7, p 45*
 Fishing tackle, July 13, p 36*; Dec 7, p 44*
 Hardware border, July 6, p 38*
 Heating apparatus, Sep 28, p 41*; Dec 14, p 42*
 Horse goods, Dec 14, p 42*
 Just as good, Oct 5, p 41*
 Kitchen articles, July 20, p 39*; Aug 3, p 43*
 Lamps and lanterns, July 13, p 36*; Aug 17, p 33*; Dec 7, p 44*
 Scythes, Sep 21, p 38*
 Shears, Aug 10, p 38*
 Skates and sleds, July 27, p 39*
 Sporting goods, Dec 7, p 45
 Stores, Aug 10, p 38*
 Tinware, Sep 21, p 38*
 Wood saw, Aug 3, p 43*

Africa:

 Chat with South African buyer, Dec 28, p 40
 Opportunities for trade, Oct 12, p 15
 Agricultural consumption of manufactured products, Dec 14, p 17
 Air brakes, Westinghouse, in Russia, Aug 3, p 19
 Air compressor, Electric motor, Nov 2, p 10*
 Air gun, Cycloid, Sep 14, p 43*
 Ajax Mfg. Company, Aug 3, p 16
 Alabama Consolidated Coal & Iron Company, Oct 5, p 18
 Alabama's ore supplies, Sep 21, p 12
 Alan Wood Company, Nov 30, p 14*
 Albany Hardware & Iron Company, July 20, p 38
 Albion Power Company, Nov 30, p 9
 Aluminium transmission line, California, Oct 12, p 2
 Amalgamated Association and Trusts, Sep 28, p 3
 American Air Power Company, Nov 16, p 13
 American Bicycle Company, July 20, p 37; Sep 7, p 35
 American Blower Company, Aug 3, p 14
 American Boiler Manufacturers' Association, July 27, p 18; Aug 3, p 6
 American Brass Company, Dec 21, p 22
 American Bridge Company, Sep 14, p 33
 American Car & Foundry Company, Sep 7, p 26
 American Carburizing Company, Aug 10, p 19
 American Federation of Labor, Dec 28, p 20
 American Glucose Company vs. Harding, Oct 26, p 15, 18
 American Hardware Mfg. Company, Aug 17, p 38
 American Harrow Company, July 20, p 52
 American Institute of Mining Engineers, Oct 5, p 2; Nov 16, p 14
 American Iron & Steel Mfg. Company, July 20, p 42; Aug 3, p 44; Aug 31, p 36
 American Nickeloid Company, Oct 5, p 4
 American Plumbing Supply & Lead Company, Aug 10, p 12
 American Pulley Company, Nov 30, p 14
 American Saddle Company, Oct 12, p 40
 American Society of Mechanical Engineers, Nov 23, p 29; Dec 7, p 20
 American Steel & Wire Company, July 6, p 24; Sep 7, p 12, 41; Nov 9, p 39
 John W. Gates before Industrial Commission, Nov 16, p 33
 Neville Island purchase, Dec 21, p 21
 Vs. Morehouse & Wells Company, Sep 14, p 19
 American Steel Hoop Company, Aug 24, p 27
 Testimony before Federal Industrial Commission, Oct 19, p 35
 American Switch Company, Aug 10, p 7
 American Tin Plate Company:
 Exhibit at Philadelphia, Nov 30, p 15*
 Notes on works, Aug 3, p 7
 Removal of offices to New York, Nov 9, p 14
 Testimony before Federal Industrial Commission, Oct 19, p 31; Nov 23, p 5
 Wage scale, July 6, p 15; July 20, p 20; Sep 21, p 11
 Ames, Oakes A., Death, Sep 28, p 36*
 Anderson, Duncan, Jr., The yield of coal in coking, Sep 28, p 4

Anthony-Bates upright tapper, July 6, p 8*
 Anti-rattler and bolt holder, Oct 5, p 46*
 Aprons, Leather, July 27, p 44*
 Arcade Mfg. Company, July 20, p 53
 Arch, Large steel, Moving, July 20, p 1*
 Armor plate imbroglio, Dec 21, p 14
 Armor plate scaling machine, American pneumatic, Nov 9, p 13*
 Army rapid fire gun contract, July 6, p 13
 Art idea in builders' hardware, Sep 7, p 31
 Ash sifter, Economy dustless, Dec 14, p 48*
 Association of American Steel Manufacturers, Nov 23, p 14
 Athara bridge, Aug 31, p 6; Sep 7, p 4
 Atikokan range, Canada, Aug 3, p 13
 Australian freight route, New, Nov 2, p 47
 Australian letters, Nov 2, p 48; Nov 9, p 42; Nov 30, p 42; Dec 14, p 39
 Austria:
 Advances in 50 years, Aug 10, p 2
 Iron industry, July 13, p 3
 Automobile, The demand for, Aug 10, p 15
 Avery, C. M., & Co., Nov 2, p 45
 Axle box, Self lubricating, July 13, p 15*

B.

Baird, G. A., Address of, Nov 23, p 51
 Baldwin, F. E., July 13, p 41
 Ball bearing blocks, Nov 9, p 49*
 Ball Engine Company, Aug 3, p 12
 Baltimore resolutions, Oct 5, p 16
 Bank, Globe, Aug 3, p 47*
 Bankers on currency legislation, Sep 14, p 18
 Banking reform, Occasion for, Sep 28, p 14
 Bankruptcy convention, National, Chicago, July 13, p 18; Aug 3, p 2, 17
 Bankruptcy law, Aug 10, p 3; Sep 28, p 8; Dec 7, p 2
 Bar iron extras, Fall of, Sep 14, p 19
 Barker, W. C., American and European export methods, Nov 9, p 15
 Barrels, Steel shipping, Aug 31, p 39*
 Barrett glass cutters, July 20, p 52
 Basic lined gas furnaces for malleable casting manufacture, Nov 9, p 4; Nov 16, p 18
 Basket, Steel bushel, Aug 31, p 38*; Nov 16, p 50*
 Bell, R. E., Credit methods, Aug 17, p 32
 Bells:
 Gong Bell Mfg. Company, Dec 21, p 47*
 New Departure, Aug 24, p 43*; Aug 31, p 39*; Sep 7, p 42; Dec 28, p 45*
 Benches, Wood workers', Sep 21, p 45*
 Beresford, Lord Charles, Openings for mechanical engineers in China, Dec 28, p 5
 Bessemer Works at South Chicago, July 6, p 1*
 Bessemerizing copper matte, Dec 14, p 9
 Bevel gear cutting machines:
 Brown & Sharpe, Sep 7, p 1*
 Leland & Falconer, Sep 14, p 1*
 Rice machine, Sep 21, p 1*
 Bevin Bros. Mfg. Company, July 27, p 44
 Bibliography of copper in iron and steel, Nov 30, p 5
 Bicycle chain, Chantrell twin roller, Dec 7, p 50*
 Bicycle coaster and brake, Trebert, Sep 28, p 46*
 Bicycle grip, Detroit, Oct 5, p 45*

- Bicycle guard, Sapon detachable, Dec 21, p 45*
- Bicycle handle bar, Claus, Dec 21, p 48*
- Bicycle holders:
Bown cycle rack, Oct 19, p 50*
- Star stand for repair men, Nov 16, p 51*
- Bicycle hubs, Aurora roller bearing, Dec 7, p 49*
- Bicycle lamps:
Baldwin acetylene, Oct 12, p 42*
- Columbia acetylene, Nov 23, p 65*
- Revolving Search Light, Oct 5, p 42*
- Twin acetylene head, Dec 14, p 47*
- Bicycle pumps (See Tire pumps).
- Bicycle saddle, Esmond, Nov 16, p 52*
- Bicycle safety strap, July 6, p 43*
- Bicycle towing cord, Nov 2, p 52*
- Bicycle tubes, Strength of, Aug 3, p 10*
- Bicycle wrenches:
Mossberg, Aug 17, p 38*
- Springfield 1900, Sep 7, p 43*
- Bicycles, Standardizing, Sep 21, p 18
- Bindley, John, Portrait, Nov 23, p 56*
- Birge, J. C., Address of, Nov 23, p 50
- Birkline, John, Utilization of waste, Aug 10, p 10
- Bishop, H. H., Address of, Nov 23, p 43, 57
- Black, J. W., Portrait, Oct 19, p 47*
- Blacksmiths' power hammer, July 6, p 5*
- Blast furnace gas for power, July 6, p 6*; Aug 3, p 3*
- Blast furnace skimmer and metal trough, Nov 16, p 13*
- Blast furnaces:
National Steel Company, Dec 21, p 1*
- New plants, Nov 2, p 19
- Toronto, New furnace, July 6, p 14
- Bliss, E. W., Company:
Pumping engine, Bliss-Heath, Nov 30, p 9*
- Screw machine, Automatic, Oct 19, p 14*
- Blowing engines:
Large orders, Aug 24, p 8
- New system of valves, July 13, p 7*
- Blue Mountain Iron & Steel Company, Sep 28, p 32; Oct 19, p 19
- Boiler makers' hours in Chicago, July 27, p 15
- Boiler Manufacturers' meeting, July 27, p 18; Aug 3, p 6
- Boiler plate shearings, Duty on, Dec 21, p 17
- Boiler rating, Oct 5, p 29
- Boiler tubes, Nickel steel vs. mild steel, Aug 10, p 12*
- Boilers:
Freeman fire box marine, July 20, p 10*
- Water tube, in U. S. Navy, Nov 23, p 9
- Bolt and nut consolidation, Aug 3, p 44
- Bolt cutters:
Ajax, Aug 3, p 16*
- Helwig pneumatic clipper, Oct 12, p 9*
- Bolt heading machine, Oct 26, p 48*
- Bolt holder, Eclipse, Oct 5, p 46*
- Book reviews:
California Mines and Minerals, Dec 28, p 19
- Directory of Directors in New York, Nov 30, p 20
- Fire Proofing of Steel Buildings, J. K. Freitag, Nov 30, p 20
- Formulas and Tables for Heating, J. H. Kinealy, Dec 28, p 19
- Hand Book on Cements, A. H. Clarke, Dec 14, p 29
- History of a Pool, Dec 21, p 42
- History of Manufacture of Armor Plate for U. S. Navy, Dec 28, p 19
- Metal Plate Work, C. T. Millis, Sep 28, p 28
- Monopolies and the People, C. W. Baker, Nov 16, p 15
- Poor's Manual of Railroads, Oct 12, p 28d
- Border, Hardware, July 6, p 38*
- Borgfeldt, George, & Co., Aug 10, p 40; Aug 17, p 38
- Boring, drilling and milling machine, Sellers, Nov 23, p 1*
- Boring tool attachment, Champion, July 27, p 11*
- Bracket, Griffin, Oct 19, p 50*
- Bradley compact hammer, Oct 5, p 1*
- Brass consolidation, Nov 2, p 31
- Brass industry in the Naugatuck Valley, Oct 26, p 8
- Bridgeport Mfg. Company, July 27, p 44
- Bridges:
Atbara, Aug 31, p 6; Sep 7, p 4
- East River, Specifications, Nov 16, p 20*
- Railroads and wooden bridges, Aug 10, p 17
- Replacing drawbridge, Penn. Ry, July 27, p 1*
- Bridgewater Iron Company, Dec 14, p 44
- Brindley hydraulic working valve, Oct 12, p 12*
- British Westinghouse Company, July 27, p 28
- Brooklyn Navy Yard, Aug 10, p 19; Aug 24, p 18; Sep 21, p 8; Oct 12, p 17; Nov 30, p 7, 12
- Broom, Mogul rattan, Dec 7, p 48*
- Brown, Archer, Outlook in American iron industry, Oct 5, p 6
- Brown, G. W., Jr., Advertising methods, Aug 31, p 34
- Brown, W. L., Foreign impressions, Oct 26, p 3
- Brown & Sharpe bevel gear cutting machine, Sep 7, p 1*
- Buckley & Douglas Lumber Company, Oct 12, p 5
- Buffing lathe and emery wheel, Electric motor, Nov 30, p 13*
- Builders' hardware:
Art idea in, Sep 7, p 31
- Plea for better goods, Dec 21, p 41
- Builders' hardware trade, Crisis in, Aug 24, p 16
- Building code of New York City, Dec 28, p 17
- Building trade:
Activity in building, Aug 10, p 28
- Chicago troubles, Nov 9, p 17; Nov 16, p 9, 17; Nov 23, p 3; Nov 30, p 13, 17; Dec 14, p 18
- Effect of prices for steel, Dec 7, p 17
- Buildings:
Moving court house by rail, Aug 3, p 8
- Palaces of foreign nations at Paris, Dec 7, p 5*
- Rebuilding a machine shop, Aug 10, p 1*
- Bulet, The Dum-dum, and the Peace Conference, July 13, p 15*
- Bullock Electric Mfg. Company, Sep 21, p 15; Oct 26, p 9
- Burners, Smokeless, July 27, p 45*
- Rush, E. M., Advertisement, Aug 3, p 41*
- Business forms, Vest pocket price book, Sep 28, p 39*
- Business methods:
Advice by an old man, July 27, p 42
- Buyer's point of view, Sep 14, p 39; Nov 9, p 39; Nov 23, p 63; Dec 7, p 42; Dec 14, p 40; Dec 28, p 42
- Buying judiciously, July 20, p 16
- Catalogue, Use of, Aug 17, p 33
- Country business methods, Aug 24, p 35
- Credit methods of R. E. Bell, Aug 17, p 32
- Credit to cash experiments, July 20, p 40; July 27, p 38
- Hints on management of stores, Aug 10, p 37
- How to make money, Sep 28, p 42
- Present opportunities, Aug 24, p 36
- Pushing trade, Nov 23, p 64
- Selling prices, Changing of, July 20, p 51; July 27, p 37; Aug 3, p 40; Aug 10, p 38
- Stationery, Effectiveness of, Aug 31, p 35
- Terms, net cash in thirty days, Sep 14, p 18
- Treatment of customers, Dec 28, p 39 (See also Advertising.)
- Business situation:
Diminished output per capita, Aug 17, p 15
- Full employment of capital, Oct 5, p 17 (See also Finance.)
- Butt slotting machine, Electrically driven, Dec 7, p 1*
- Buyer's point of view, Sep 14, p 39; Nov 9, p 39; Nov 23, p 63; Dec 7, p 42; Dec 14, p 40; Dec 28, p 42
- Buying judiciously, July 20, p 16
- By-products of charcoal manufacture, Influence on the charcoal pig iron industry, Oct 5, p 7
- C.
Cabinet, Heller's bolt, Nov 2, p 52*
- Cabinet scraper, Saw steel, Oct 5, p 46*
- Cambria Iron Company vs. Carnegie Steel Company, Nov 23, p 20
- Canada:
Customs requirements, July 13, p 39; Sep 28, p 12
- Iron trade, 1898, July 6, p 12
- Pig iron production, Aug 17, p 7
- Canada Cycle & Motor Company, Sep 7, p 2
- Canadian hardware trade, Dec 7, p 41
- Canadian news, July 27, p 11; Aug 17, p 8; Aug 24, p 10; Aug 31, p 13; Sep 7, p 10; Sep 28, p 12; Oct 12, p 4; Nov 2, p 15; Nov 9, p 11; Nov 16, p 12; Dec 7, p 14; Dec 14, p 7; Dec 21, p 12
- Bicycle amalgamation, Aug 24, p 10
- Cape Breton steel plants, Sep 7, p 11
- Corundum lands, Nov 2, p 15
- Fort William furnace projects, Dec 21, p 12
- Freights on hardware, Dec 21, p 12
- Iron bounties bill, July 27, p 11
- Iron prices, Nov 9, p 11
- Steel famine, Sep 7, p 11
- Canadian Niagara Power Company, July 27, p 4
- Canadian Wholesale Hardware Association, Nov 23, p 53
- Candle, Electric, Dec 7, p 49*
- Canfield, H. O., July 20, p 54
- Cape Colony iron trade in 1898, July 20, p 10
- Capital, Full employment of, Oct 5, p 17
- Capital required to start hardware store, Dec 28, p 42
- Car famine, Oct 19, p 15
- Car tenoning and gaining machine, Fa. Oct 19, p 11*
- Carnegie, Andrew, Address of, Nov 23, p 58
- Carnegie Steel Company:
Metal mixer patent, Nov 23, p 20
- New furnaces, Oct 5, p 26c
- Reorganization, Nov 16, p 36; Dec 7, p 20; Dec 14, p 30
- Carrier, Handy luggage, Aug 17, p 38*
- Cars, Steel, Statistics, July 27, p 5
- Cartage charges, A protest, Sep 21, p 39
- Carter, J. A., Address of, Nov 23, p 51
- Carter wire fence machine, Dec 14, p 34
- Case hardening, Oct 5, p 5
- Cash business:
Cash discount and the National Hardware Association, Nov 23, p 17, 54; Nov 30, p 43; Dec 7, p 46
- Credit to cash experiments, July 20, p 40; July 27, p 38
- Terms, Net cash in 30 days, Sep 14, p 18
- Cash recorder, Hough, Sep 21, p 43
- Cast borings, Prices of, Dec 14, p 18
- Cast iron, Physical characteristics of malleable, Nov 9, p 4; Nov 16, p 18
- Cast iron soil pipe combination, July 13, p 12; July 20, p 20; July 27, p 29
- Casters:
Acme ball bearing, Aug 3, p 47*
- Arrow stem, Aug 31, p 40*
- Casting machine, Wainford, Aug 31, p 15
- Castings:
Classification and price-list, Sep 28, p 16
- Manufacture of steel, Nov 30, p 10
- Catalogue, Use by hardware store, Aug 17, p 33
- Center grinder, Simplex lathe, Sep 7, p 9*
- Central Foundry Company, July 13, p 12; July 20, p 20; July 27, p 29
- Chain consolidation, Nov 16, p 40
- Chairs, Lawn and porch, Nov 9, p 49*

- Challenge Cutlery Corporation, Aug 3, p 46.
- Chamberlain, P. M., A metal dynamograph, Dec. 14, p 8*
- Champion boring tool attachment, July 27, p 11*
- Champion Iron & Steel Company, Sep 14, p 17; Sep 21, p 9
- Charcoal iron industry, July 27, p 15; Oct 5, p 7
- Charter gasoline engine, July 6, p 12*
- Chicago Coliseum, Collapse of, Sep 7, p 12; Sep 14, p 5
- Chicago labor troubles, Nov 9, p 17; Nov 16, p 9, 17; Nov 23, p 3; Nov 30, p 13, 17
- Chicago Malleable Castings Company, Sep 14, p 11
- Chicago Retail Hardware Dealers' Association, Aug 3, p 39
- Chicago Shipbuilding Company, Nov 23, p 11*
- Chicago Time Register Company, July 20, p 53
- Chicago Transfer & Clearing Company, July 20, p 3
- Chicago Trust Conference, Sep 7, p 16; Sep 28, p 14
- Chill, Iron works and other industries, July 20, p 5
- Chimney struck by lightning, July 13, p 12*
- China:
- Great wall to be razed, Sep 7, p 31
 - Openings for mechanical engineers, Dec 28, p 5
- Christensen electric motor compressor, Nov 2, p 10*
- Chucks:
- Walker magnetic, July 27, p 8*
 - Yankee chuck, Aug 31, p 40*
- City and country workmen, July 27, p 15
- Clark, J. R., Company, Aug 3, p 46
- Classification and price-list of castings, Sep 28, p 16
- Classifications, Standard steel, Nov 16, p 31; Nov 23, p 20
- Clerks, Successful, July 20, p 49
- Cleveland Association of Retail Furnace Dealers, Dec 7, p 46
- Cleveland Galvanizing Works, Aug 31, p 38
- Cleveland Twist Drill Company, Nov 30, p 44
- Clevis, Kruse Kross, Aug 24, p 43*
- Clothes line tightener, Oct 19, p 49*
- Clothes rack, Rogers', Sep 21, p 43*
- Clothes wringer, Hamilton, Aug 17, p 39*
- Coal:
- Chicago situation, Oct 19, p 19
 - Illinois production, Dec 21, p 34
 - World's production, Nov 16, p 6
- Coal mining machines in Ohio, Oct 28, p 32
- Coaling vessels at sea, Nov 23, p 8*
- Coast fortifications, Dec 28, p 1*
- Coaster and brake, Morrow, Aug 10, p 42*
- Coffee mills:
- Crystal, July 20, p 53*
 - None-Such, July 27, p 45*
- Coffee pots:
- Lalance & Grosjean, Aug 3, p 46*
 - Queen percolator, Nov 2, p 50*
- Cohoe, W. P., Address, Oct 19, p 41
- Coke:
- Advantages over coal for steam fuel, Oct 12, p 2
 - Freight rates, Dec 28, p 34
 - Production from Illinois coal, Dec 28, p 16
 - Production of 1898, July 27, p 10
- Coking:
- Hemingway process, Aug 10, p 8; Sep 21, p 10
 - Yield of coal, Sep 28, p 4
- Colby, A. L., Copper in steel, Nov 30, p 1*
- Cold saw machines, Lucas & Gliem, Aug 17, p 1*
- Cole, H. A., How to meet department store competition, Oct 26, p 44
- Coleman Gas Works Mfg. Company, July 13, p 44
- Collar, Seamless non-detachable for water pipe, July 13, p 43*
- Collis circulating valve, Oct 12, p 13*
- Color printing machine, Sep 14, p 8
- Color temperatures of steel, Dec 21, p 33
- Colorado Fuel & Iron Company, Aug 31, p 18; Sep 14, p 14
- Commerce convention, New York State, Nov 2, p 4
- Compact hammer, Bradley, Oct 5, p 1*
- Compressor, Electric motor, Nov 2, p 10*
- Concrete docks, Illinois Steel Company, Dec 14, p 1*
- Consolidation. (See Trusts.)
- Constantinople, American hardware in, Nov 2, p 47
- Continental Tool Company, Dec 21, p 43
- Contract, Interpretation of, July 13, p 38; July 20, p 37; July 27, p 36
- Contractors and the War Department, Nov 9, p 20
- Copper:
- Bibliography of copper in iron and steel, Nov 30, p 5
 - Copper in steel, Nov 30, p 1*
 - Increased production in United States, July 20, p 17
 - Lake vs. electrolytic copper, Oct 5, p 16
 - Peru as a producer, Nov 9, p 16
 - Prices, 1890-1899, Oct 26, p 14
 - Copper coins, Importation of, Aug 10, p 4
- Corbin Cabinet Lock Company, July 13, p 36, 42; Nov 16, p 48
- Corn popper, Sliding cover, Sep 21, p 45*
- Cow tie and stall fixture, Aug 3, p 48*
- Cozzens, F. H., Portrait, July 20, p 44*, 48
- Cramp shipyards, Enlargement, Aug 10, p 2
- Cranes:
- English hydraulic jib crane, Oct 12, p 11*
 - Moore pneumatic traveling, Dec 21, p 14*
 - Shipyard cranes, Nov 23, p 12*
 - Whiting compressed air, Nov 2, p 7*
- Crank shaper, Kelly adjustable, Nov 16, p 7*
- Credit methods of R. E. Bell, Aug 17, p 32
- Credit to cash experiments, July 20, p 40; July 27, p 38
- Creeper, Klondike, Nov 2, p 51*
- Crescent emery grinder, July 13, p 14*
- Cresson, G. V., Company, Nov 30, p 15
- Crimping and corrugating machine, Keene, Aug 10, p 5*
- Crist, R. G., and trade winning methods, July 6, p 36
- Cronk Hanger Company, July 13, p 41
- Crops, Western situation, July 27, p 15; Aug 24, p 7; Oct 12, p 14
- Crowbar and the tramp, Sep 21, p 37
- Crucible steel situation, Sep 14, p 20
- Cuba:
- Iron mines, Aug 17, p 3
 - Tariff, Aug 31, p 11; Sep 7, p 10
- Cumberland Steel & Tin Plate Company, Nov 16, p 4
- Currency. (See Finance.)
- Curry comb and the saw horse, Aug 3, p 43
- Customs receipts for 1899, Oct 12, p 3
- Cutler-Hammer motor starters, Nov 16, p 11*
- Cutting off machines:
- Davis, Aug 17, p 5*
 - Lucas & Gliem, Aug 17, p 1*; Nov 2, p 3*
- D.
- Damming the Niagara River, Oct 12, p 6
- D'Amour & Littledale drill, Aug 3, p 7*
- Dane, A. H., Experiences of a traveling man, July 20, p 46
- Danville Bessemer Company, Aug 31, p 10
- Davis, J. M., & Sons' use of catalogue, Aug 17, p 38
- Davis cutting off machine, Aug 17, p 5*
- Davis Glass Company vs. A. B. Duff, July 13, p 19
- Deere & Co.'s plant, Sep 28, p 6
- Defiance cup wheel grinding machine, Aug 17, p 13*
- Delaval turbine, Nov 2, p 2
- Department stores:
- Chicago agitation, Dec 28, p 20
 - How to meet competition, Oct 26, p 44
- Derrick engine, Lidgerwood, Oct 19, p 12*
- Diagram of fluctuations in prices of iron and steel, 1892-99, July 27, p 16
- Diamond State Steel Company, July 20, p 12
- Die stock, National, Dec 28, p 48*
- Discount system in the English iron trade, July 6, p 11
- Disk fan engine, American Blower Company, Aug 3, p 14*
- Disston, Henry, & Sons, July 13, p 34
- Dividends on industrial stocks, July 6, p 16
- Docks, Concrete, Illinois Steel Company, Dec 14, p 1*
- Dodge power transmission system, Nov 2, p 7
- Door check and spring, Larimer, Oct 5, p 45*
- Door holder, Empire, Sep 7, p 41*
- Douglas, James, Address of, Oct 5, p 2
- Downs, W. F., California meeting of American Institute of Mining Engineers, Nov 16, p 14
- Draft, Forced, New method, Aug 10, p 9*
- Drawbridge, Replacing large, July 27, p 1*
- Drawer bases, Warren interchangeable, Sep 7, p 43*
- Drawer pull, Ball bearing, Dec 28, p 46*
- Driggs-Seabury Gun & Ammunition Company, July 6, p 13
- Drill, Yankee reciprocating, Aug 24, p 43*
- Drill points, Yankee, Aug 31, p 40*
- Drilling machines:
- D'Amour & Littledale, Aug 3, p 7*
 - Knecht friction sensitive drill, July 6, p 5*
 - Lucas & Gliem, Aug 31, p 9*
 - Monarch pneumatic wood drill, Sep 21, p 13*
 - Sellers' combination, Nov 23, p 1*
 - Stover 20-inch drill, Sep 14, p 11*
 - Ten-spindle drill, Oct 12, p 1*
- Duquesne Steel Foundry Company, Dec 7, p 20
- Dustpan, Foothold, Oct 19, p 50*
- Dynamo, Bullock street railway, Sep 21, p 15*
- Dynamograph, Metal, Dec 14, p 8*
- E.
- East River bridge specifications, Nov 16, p 20*
- Eddy, U. D., Advantages of industrial consolidations, Nov 2, p 20
- Edison-Holzer secret process, Oct 12, p 21
- Elba iron mines, Nov 16, p 12
- Electric fan, Eight-pole motor, Aug 10, p 11*
- Electric motors:
- Bullock, Oct 26, p 9*
 - Cutler-Hammer motor starters, Nov 16, p 11*
- Electric power:
- Aluminum transmission line, Oct 12, p 2
 - Tiete River, Brazil, Oct 5, p 4
- Electric power and house industries, France, Aug 17, p 1
- Electric tramways and British industry, Nov 23, p 5
- Electric Vehicle Company, Report, Sep 28, p 10
- Electricity on war ships, Nov 23, p 11, 30
- Electrolysis of cast iron pipes, Oct 12, p 13
- Emery wheels:
- Crescent, July 13, p 14*
 - Electric motor, Nov 30, p 13*
 - Reisch foot power, Oct 12, p 42*
- Empire State Power Company, Oct 12, p 7
- Empire Steel & Iron Company purchases, July 27, p 17
- Employees as stockholders, Nov 30, p 19

- Bicycle guard, Sapon detachable, Dec 21, p 45*
- Bicycle handle bar, Claus, Dec 21, p 48*
- Bicycle holders:
Bown cycle rack, Oct 19, p 50*
- Star stand for repair men, Nov 16, p 51*
- Bicycle hubs, Aurora roller bearing, Dec 7, p 49*
- Bicycle lamps:
Baldwin acetylene, Oct 12, p 42*
- Columbia acetylene, Nov 23, p 65*
- Revolving Search Light, Oct 5, p 42*
- Twin acetylene head, Dec 14, p 47*
- Bicycle pumps (See Tire pumps).
- Bicycle saddle, Esmond, Nov 16, p 52*
- Bicycle safety strap, July 6, p 43*
- Bicycle towing cord, Nov 2, p 52*
- Bicycle tubes, Strength of, Aug 3, p 10*
- Bicycle wrenches:
Mossberg, Aug 17, p 38*
- Springfield 1900, Sep 7, p 43*
- Bicycles, Standardizing, Sep 21, p 18
- Bindley, John, Portrait, Nov 23, p 56*
- Birge, J. C., Address of, Nov 23, p 50
- Birkinbine, John, Utilization of waste, Aug 10, p 10
- Bishop, H. H., Address of, Nov 23, p 43, 57
- Black, J. W., Portrait, Oct 19, p 47*
- Blacksmiths' power hammer, July 6, p 5*
- Blast furnace gas for power, July 6, p 6*; Aug 3, p 3*
- Blast furnace skimmer and metal trough, Nov 16, p 13*
- Blast furnaces:
National Steel Company, Dec 21, p 1*
- New plants, Nov 2, p 19
- Toronto, New furnace, July 6, p 14
- Bliss, E. W., Company:
Pumping engine, Bliss-Heath, Nov 30, p 9*
- Screw machine, Automatic, Oct 19, p 14*
- Blowing engines:
Large orders, Aug 24, p 8
- New system of valves, July 13, p 7*
- Blue Mountain Iron & Steel Company, Sep 28, p 32; Oct 19, p 19
- Boiler makers' hours in Chicago, July 27, p 15
- Boiler Manufacturers' meeting, July 27, p 18; Aug 3, p 6
- Boiler plate shearings, Duty on, Dec 21, p 17
- Boiler rating, Oct 5, p 29
- Boiler tubes, Nickel steel vs. mild steel, Aug 10, p 12*
- Boilers:
Freeman fire box marine, July 20, p 10*
- Water tube, in U. S. Navy, Nov 23, p 9
- Bolt and nut consolidation, Aug 3, p 44
- Bolt cutters:
Ajax, Aug 3, p 16*
- Helwig pneumatic clipper, Oct 12, p 9*
- Bolt heading machine, Oct 26, p 48*
- Bolt holder, Eclipse, Oct 5, p 46*
- Book reviews:
California Mines and Minerals, Dec 28, p 19
- Directory of Directors in New York, Nov 30, p 20
- Fire Proofing of Steel Buildings, J. K. Freitag, Nov 30, p 20
- Formulas and Tables for Heating, J. H. Kinealy, Dec 28, p 19
- Hand Book on Cements, A. H. Clarke, Dec 14, p 29
- History of a Pool, Dec 21, p 42
- History of Manufacture of Armor Plate for U. S. Navy, Dec 28, p 19
- Metal Plate Work, C. T. Millis, Sep 28, p 28
- Monopolies and the People, C. W. Baker, Nov 16, p 15
- Poor's Manual of Railroads, Oct 12, p 28d
- Border, Hardware, July 6, p 38*
- Borgfeldt, George, & Co., Aug 10, p 40; Aug 17, p 38
- Boring, drilling and milling machine, Sellers, Nov 23, p 1*
- Boring tool attachment, Champion, July 27, p 11*
- Bracket, Griffin, Oct 19, p 50*
- Bradley compact hammer, Oct 5, p 1*
- Brass consolidation, Nov 2, p 31
- Brass industry in the Naugatuck Valley, Oct 26, p 8
- Bridgeport Mfg. Company, July 27, p 44
- Bridges:
Atbara, Aug 31, p 6; Sep 7, p 4
- East River, Specifications, Nov 16, p 20*
- Railroads and wooden bridges, Aug 10, p 17
- Replacing drawbridge, Penn. Ry, July 27, p 1*
- Bridgewater Iron Company, Dec 14, p 44
- Brindley hydraulic working valve, Oct 12, p 12*
- British Westinghouse Company, July 27, p 28
- Brooklyn Navy Yard, Aug 10, p 19; Aug 24, p 18; Sep 21, p 8; Oct 12, p 17; Nov 30, p 7, 12
- Broom, Mogul rattan, Dec 7, p 48*
- Brown, Archer, Outlook in American iron industry, Oct 5, p 6
- Brown, G. W., Jr., Advertising methods, Aug 31, p 34
- Brown, W. L., Foreign impressions, Oct 26, p 3
- Brown & Sharpe bevel gear cutting machine, Sep 7, p 1*
- Buckley & Douglas Lumber Company, Oct 12, p 5
- Buffing lathe and emery wheel, Electric motor, Nov 30, p 13*
- Builders' hardware:
Art idea in, Sep 7, p 31
- Plea for better goods, Dec 21, p 41
- Builders' hardware trade, Crisis in, Aug 24, p 16
- Building code of New York City, Dec 28, p 17
- Building trade:
Activity in building, Aug 10, p 28
- Chicago troubles, Nov 9, p 17; Nov 16, p 9, 17; Nov 23, p 3; Nov 30, p 13, 17; Dec 14, p 18
- Effect of prices for steel, Dec 7, p 17
- Buildings:
Moving court house by rail, Aug 3, p 8
- Palaces of foreign nations at Paris, Dec 7, p 5*
- Rebuilding a machine shop, Aug 10, p 1*
- Bullet, The Dum-dum, and the Peace Conference, July 13, p 15*
- Bullock Electric Mfg. Company, Sep 21, p 15; Oct 26, p 9
- Burners, Smokeless, July 27, p 45*
- Bush, E. M., Advertisement, Aug 3, p 41*
- Business forms, Vest pocket price book, Sep 28, p 39*
- Business methods:
Advice by an old man, July 27, p 42
- Buyer's point of view, Sep 14, p 39; Nov 9, p 39; Nov 23, p 63; Dec 7, p 42; Dec 14, p 40; Dec 28, p 42
- Buying judiciously, July 20, p 16
- Catalogue, Use of, Aug 17, p 33
- Country business methods, Aug 24, p 35
- Credit methods of R. E. Bell, Aug 17, p 32
- Credit to cash experiments, July 20, p 40; July 27, p 38
- Hints on management of stores, Aug 10, p 37
- How to make money, Sep 28, p 42
- Present opportunities, Aug 24, p 36
- Pushing trade, Nov 23, p 64
- Selling prices, Changing of, July 20, p 51; July 27, p 37; Aug 3, p 40; Aug 10, p 38
- Stationery, Effectiveness of, Aug 31, p 35
- Terms, net cash in thirty days, Sep 14, p 18
- Treatment of customers, Dec 28, p 39 (See also Advertising.)
- Business situation:
Diminished output per capita, Aug 17, p 15
- Full employment of capital, Oct 5, p 17 (See also Finance.)
- Butt slotting machine, Electrically driven, Dec 7, p 1*
- Buyer's point of view, Sep 14, p 39; Nov 9, p 39; Nov 23, p 63; Dec 7, p 42; Dec 14, p 40; Dec 28, p 42
- Buying judiciously, July 20, p 16
- By-products of charcoal manufacture, Influence on the charcoal pig iron industry, Oct 5, p 7
- C.
- Cabinet, Heller's bolt, Nov 2, p 52*
- Cabinet scraper, Saw steel, Oct 5, p 46*
- Cambria Iron Company vs. Carnegie Steel Company, Nov 23, p 20
- Canada:
Customs requirements, July 13, p 39; Sep 28, p 12
- Iron trade, 1898, July 6, p 12
- Pig iron production, Aug 17, p 7
- Canada Cycle & Motor Company, Sep 7, p 2
- Canadian hardware trade, Dec 7, p 41
- Canadian news, July 27, p 11; Aug 17, p 8; Aug 24, p 10; Aug 31, p 13; Sep 7, p 10; Sep 28, p 12; Oct 12, p 4; Nov 2, p 15; Nov 9, p 11; Nov 16, p 12; Dec 7, p 14; Dec 14, p 7; Dec 21, p 12
- Bicycle amalgamation, Aug 24, p 10
- Cape Breton steel plants, Sep 7, p 11
- Corundum lands, Nov 2, p 15
- Fort William furnace projects, Dec 21, p 12
- Freights on hardware, Dec 21, p 12
- Iron bounties bill, July 27, p 11
- Iron prices, Nov 9, p 11
- Steel famine, Sep 7, p 11
- Canadian Niagara Power Company, July 27, p 4
- Canadian Wholesale Hardware Association, Nov 23, p 53
- Candle, Electric, Dec 7, p 49*
- Canfield, H. O., July 20, p 54
- Cape Colony iron trade in 1898, July 20, p 10
- Capital, Full employment of, Oct 5, p 17
- Capital required to start hardware store, Dec 28, p 42
- Car famine, Oct 19, p 15
- Car tenoning and gaining machine, Fa. Oct 19, p 11*
- Carnegie, Andrew, Address of, Nov 23, p 58
- Carnegie Steel Company:
Metal mixer patent, Nov 23, p 20
- New furnaces, Oct 5, p 26c
- Reorganization, Nov 16, p 36; Dec 7, p 20; Dec 14, p 30
- Carrier, Handy luggage, Aug 17, p 38*
- Cars, Steel, Statistics, July 27, p 5
- Cartage charges, A protest, Sep 21, p 39
- Carter, J. A. Address of, Nov 23, p 51
- Carter wire fence machine, Dec 14, p 34
- Case hardening, Oct 5, p 5
- Cash business:
Cash discount and the National Hardware Association, Nov 23, p 17, 54; Nov 30, p 43; Dec 7, p 46
- Credit to cash experiments, July 20, p 40; July 27, p 38
- Terms, Net cash in 30 days, Sep 14, p 18
- Cash recorder, Hough, Sep 21, p 43
- Cast borings, Prices of, Dec 14, p 18
- Cast iron, Physical characteristics of malleable, Nov 9, p 4; Nov 16, p 18
- Cast iron soil pipe combination, July 13, p 12; July 20, p 20; July 27, p 29
- Casters:
Acme ball bearing, Aug 3, p 47*
- Arrow stem, Aug 31, p 40*
- Casting machine, Wainford, Aug 31, p 15
- Castings:
Classification and price-list, Sep 28, p 16
- Manufacture of steel, Nov 30, p 10
- Catalogue, Use by hardware store, Aug 17, p 33
- Center grinder, Simplex lathe, Sep 7, p 9*
- Central Foundry Company, July 13, p 12; July 20, p 20; July 27, p 29
- Chain consolidation, Nov 16, p 40
- Chairs, Lawn and porch, Nov 9, p 49*

- Challenge Cutlery Corporation, Aug 3, p 46.
- Chamberlain, P. M., A metal dynamograph, Dec. 14, p 8*
- Champion boring tool attachment, July 27, p 11*
- Champion Iron & Steel Company, Sep 14, p 17; Sep 21, p 9
- Charcoal iron industry, July 27, p 15; Oct 5, p 7
- Charter gasoline engine, July 6, p 12*
- Chicago Coliseum, Collapse of, Sep 7, p 12; Sep 14, p 5
- Chicago labor troubles, Nov 9, p 17; Nov 16, p 9, 17; Nov 23, p 3; Nov 30, p 13, 17
- Ohicago Malleable Castings Company, Sep 14, p 11
- Chicago Retail Hardware Dealers' Association, Aug 3, p 39
- Chicago Shipbuilding Company, Nov 23, p 11*
- Chicago Time Register Company, July 20, p 53
- Chicago Transfer & Clearing Company, July 20, p 3
- Chicago Trust Conference, Sep 7, p 16; Sep 28, p 14
- Chili, Iron works and other industries, July 20, p 5
- Chimney struck by lightning, July 13, p 12*
- China:
- Great wall to be razed, Sep 7, p 31
- Openings for mechanical engineers, Dec 28, p 5
- Christensen electric motor compressor, Nov 2, p 10*
- Chucks:
- Walker magnetic, July 27, p 8*
- Yankee chuck, Aug 31, p 40*
- City and country workmen, July 27, p 15
- Clark, J. R., Company, Aug 3, p 46
- Classification and price-list of castings, Sep 28, p 16
- Classifications, Standard steel, Nov 16, p 31; Nov 23, p 20
- Clerks, Successful, July 20, p 49
- Cleveland Association of Retail Furnace Dealers, Dec 7, p 46
- Cleveland Galvanizing Works, Aug 31, p 38
- Cleveland Twist Drill Company, Nov 30, p 44
- Clevis, Kruse Kross, Aug 24, p 43*
- Clothes line tightener, Oct 19, p 49*
- Clothes rack, Rogers', Sep 21, p 43*
- Clothes wringer, Hamilton, Aug 17, p 39*
- Coal:
- Chicago situation, Oct 19, p 19
- Illinois production, Dec 21, p 34
- World's production, Nov 16, p 6
- Coal mining machines in Ohio, Oct 28, p 32
- Coaling vessels at sea, Nov 23, p 8*
- Coast fortifications, Dec 28, p 1*
- Coaster and brake, Morrow, Aug 10, p 42*
- Coffee mills:
- Crystal, July 20, p 53*
- None-Such, July 27, p 45*
- Coffee pots:
- Lalance & Grosjean, Aug 3, p 46*
- Queen percolator, Nov 2, p 50*
- Cohoe, W. P., Address, Oct 19, p 41
- Coke:
- Advantages over coal for steam fuel, Oct 12, p 2
- Freight rates, Dec 28, p 34
- Production from Illinois coal, Dec 28, p 16
- Production of 1898, July 27, p 10
- Coking:
- Hemingway process, Aug 10, p 8; Sep 21, p 10
- Yield of coal, Sep 28, p 4
- Colby, A. L., Copper in steel, Nov 30, p 1*
- Cold saw machines, Lucas & Gliem, Aug 17, p 1*
- Cole, H. A., How to meet department store competition, Oct 26, p 44
- Coleman Gas Works Mfg. Company, July 13, p 44
- Collar, Seamless non-detachable for water pipe, July 13, p 43*
- Collis circulating valve, Oct 12, p 13*
- Color printing machine, Sep 14, p 8
- Color temperatures of steel, Dec 21, p 33
- Colorado Fuel & Iron Company, Aug 31, p 18; Sep 14, p 14
- Commerce convention, New York State, Nov 2, p 4
- Compact hammer, Bradley, Oct 5, p 1*
- Compressor, Electric motor, Nov 2, p 10*
- Concrete docks, Illinois Steel Company, Dec 14, p 1*
- Consolidation. (See Trusts.)
- Constantinople, American hardware in, Nov 2, p 47
- Continental Tool Company, Dec 21, p 43
- Contract, Interpretation of, July 13, p 38; July 20, p 37; July 27, p 36
- Contractors and the War Department, Nov 9, p 20
- Copper:
- Bibliography of copper in iron and steel, Nov 30, p 5
- Copper in steel, Nov 30, p 1*
- Increased production in United States, July 20, p 17
- Lake vs. electrolytic copper, Oct 5, p 16
- Peru as a producer, Nov 9, p 16
- Prices, 1890-1899, Oct 26, p 14
- Copper coins, Importation of, Aug 10, p 4
- Corbin Cabinet Lock Company, July 13, p 36, 42; Nov 16, p 48
- Corn popper, Sliding cover, Sep 21, p 45*
- Cow tie and stall fixture, Aug 3, p 48*
- Cozzens, F. H., Portrait, July 20, p 44*, 48
- Cramp shipyards, Enlargement, Aug 10, p 2
- Cranes:
- English hydraulic jib crane, Oct 12, p 11*
- Moore pneumatic traveling, Dec 21, p 14*
- Shipyard cranes, Nov 23, p 12*
- Whiting compressed air, Nov 2, p 7*
- Crank shaper, Kelly adjustable, Nov 16, p 7*
- Credit methods of R. E. Bell, Aug 17, p 32
- Credit to cash experiments, July 20, p 40; July 27, p 38
- Creeper, Klondike, Nov 2, p 51*
- Crescent emery grinder, July 13, p 14*
- Cresson, G. V., Company, Nov 30, p 15
- Crimping and corrugating machine, Keene, Aug 10, p 5*
- Crist, R. G., and trade winning methods, July 6, p 36
- Cronk Hanger Company, July 13, p 41
- Crops, Western situation, July 27, p 15; Aug 24, p 7; Oct 12, p 14
- Crowbar and the tramp, Sep 21, p 37
- Crucible steel situation, Sep 14, p 20
- Cuba:
- Iron mines, Aug 17, p 3
- Tariff, Aug 31, p 11; Sep 7, p 10
- Cumberland Steel & Tin Plate Company, Nov 16, p 4
- Currency. (See Finance.)
- Curry comb and the saw horse, Aug 3, p 43
- Customs receipts for 1899, Oct 12, p 3
- Cutler-Hammer motor starters, Nov 16, p 11*
- Cutting off machines:
- Davis, Aug 17, p 5*
- Lucas & Gliem, Aug 17, p 1*; Nov 2, p 3*
- D.
- Damming the Niagara River, Oct 12, p 6
- D'Amour & Litledale drill, Aug 3, p 7*
- Dane, A. H., Experiences of a traveling man, July 20, p 46
- Danville Bessemer Company, Aug 31, p 10
- Davis, J. M., & Sons' use of catalogue, Aug 17, p 36
- Davis cutting off machine, Aug 17, p 5*
- Davis Glass Company vs. A. B. Duff, July 13, p 19
- Deere & Co.'s plant, Sep 28, p 6
- Defiance cup wheel grinding machine, Aug 17, p 13*
- Delaval turbine, Nov 2, p 2
- Department stores:
- Chicago agitation, Dec 28, p 20
- How to meet competition, Oct 26, p 44
- Derrick engine, Lidgerwood, Oct 19, p 12*
- Diagram of fluctuations in prices of iron and steel, 1892-99, July 27, p 16
- Diamond State Steel Company, July 20, p 12
- Die stock, National, Dec 28, p 48*
- Discount system in the English iron trade, July 6, p 11
- Disk fan engine, American Blower Company, Aug 3, p 14*
- Disston, Henry, & Sons, July 13, p 34
- Dividends on industrial stocks, July 6, p 16
- Docks, Concrete, Illinois Steel Company, Dec 14, p 1*
- Dodge power transmission system, Nov 2, p 7
- Door check and spring, Larimer, Oct 5, p 45*
- Door holder, Empire, Sep 7, p 41*
- Douglas, James, Address of, Oct 5, p 2
- Downs, W. F., California meeting of American Institute of Mining Engineers, Nov 16, p 14
- Draft, Forced, New method, Aug 10, p 9*
- Drawbridge, Replacing large, July 27, p 1*
- Drawer bases, Warren interchangeable, Sep 7, p 43*
- Drawer pull, Ball bearing, Dec 28, p 46*
- Driggs-Seabury Gun & Ammunition Company, July 6, p 13
- Drill, Yankee reciprocating, Aug 24, p 43*
- Drill points, Yankee, Aug 31, p 40*
- Drilling machines:
- D'Amour & Litledale, Aug 3, p 7*
- Knecht friction sensitive drill, July 6, p 5*
- Lucas & Gliem, Aug 31, p 9*
- Monarch pneumatic wood drill, Sep 21, p 13*
- Sellers' combination, Nov 23, p 1*
- Stover 20-inch drill, Sep 14, p 11*
- Ten-spindle drill, Oct 12, p 1*
- Duquesne Steel Foundry Company, Dec 7, p 20
- Dustpan, Foothold, Oct 19, p 50*
- Dynamo, Bullock street railway, Sep 21, p 15*
- Dynamograph, Metal, Dec 14, p 8*
- E.
- East River bridge specifications, Nov 16, p 20*
- Eddy, U. D., Advantages of industrial consolidations, Nov 2, p 20
- Edison-Holzer secret process, Oct 12, p 21
- Elba iron mines, Nov 16, p 12
- Electric fan, Eight-pole motor, Aug 10, p 11*
- Electric motors:
- Bullock, Oct 26, p 9*
- Cutler-Hammer motor starters, Nov 16, p 11*
- Electric power:
- Aluminum transmission line, Oct 12, p 2
- Tiete River, Brazil, Oct 5, p 4
- Electric power and house industries, France, Aug 17, p 1
- Electric tramways and British industry, Nov 23, p 5
- Electric Vehicle Company, Report, Sep 28, p 10
- Electricity on war ships, Nov 23, p 11, 30
- Electrolysis of cast iron pipes, Oct 12, p 13
- Emery wheels:
- Crescent, July 13, p 14*
- Electric motor, Nov 30, p 13*
- Reisch foot power, Oct 12, p 42*
- Empire State Power Company, Oct 12, p 7
- Empire Steel & Iron Company purchases, July 27, p 17
- Employees as stockholders, Nov 30, p 19

- Enamel furnaces, Aug 17, p 9*
- Enamels, Manufacture of, Aug 10, p 6; Aug 17, p 9*
- Engine governors, Experiments upon the action of, Oct 26, p 10*; Nov 2, p 12*
- Engineering, Teaching, Sep 7, p 30
- Engineering in the United States, Dec 7, p 20
- Engineers, Openings for mechanical, in China, Dec 28, p 5
- Engineers' Society of Western Pennsylvania, Oct 5, p 29
- Engines:
- Disk fan, American Blower Company, Aug 3, p 14*
 - Hydraulic, Johns, July 27, p 12*
 - Internal self oiling engine, Aug 3, p 12*
 - Large orders for blowing engines, Aug 24, p 8
 - Lidgerwood derrick engine, Oct 19, p 12*
 - Nordberg engine, Dec 14, p 3
 - Valves, Gordon system, July 13, p 7* (See also Gas engines.)
- England's home demand, Sep 14, p 6
- English hardware trade, Sep 28, p 37; Nov 16, p 44
- English letters, Sep 7, p 36; Nov 16, p 44; Nov 30, p 41; Dec 7, p 41; Dec 28, p 40
- English warrant market, Aug 31, p 7
- Evenson, George M., Nov 16, p 46
- Exhaust head, Sturtevant, Oct 5, p 4*
- Explosives, Government tests, throwing high explosives, Aug 3, p 31
- Export trade:
- American hardware abroad, Nov 2, p 46; Nov 30, p 41; Dec 7, p 41
 - Effect of high prices, Nov 2, p 48; Nov 30, p 43
 - Great Britain's trade, Nov 30, p 41
 - Illinois banker on foreign trade, Oct 12, p 3
 - Iron and steel, 1896-99, Aug 3, p 18; Oct 19, p 18
 - Methods in Europe and America compared, Nov 9, p 15
 - Opportunities in Africa, Oct 12, p 15
 - Possibilities in undeveloped countries, Oct 19, p 15
 - Problems in seeking foreign trade, Aug 31, p 16; Sep 28, p 13, 14; Nov 16, p 18
 - (See also Hardware trade; Iron trade.)
- Express rates, Lower, July 6, p 40
- F.
- Fables:
- Concealed magnet, The, Sep 21, p 37
 - Crowbar and the tramp, Sep 21, p 37
- Failures in business, July 20, p 13
- Fairbanks Company, Nov 30, p 14
- Fairbairn, W. M., Death, Nov 2, p 45*
- Fairmount Zinc Co., July 13, p 14
- Fan, Electric, 8-pole motor, Aug 10, p 11*
- Farm implement trade, Sep 28, p 15
- Fawcett, Waldon:
- Record of the year in shipbuilding, Dec 14, p 10
 - Struggle for the lake shipping, Oct 19, p 30d
- Fay ear tenoning and gaining machine, Oct 19, p 11*
- Fay cutting off saw, July 20, p 13*
- Fay & Scott lathe, Nov 16, p 1*
- Federal Industrial Commission investigation of iron and steel consolidations, Oct 19, p 31; Oct 26, p 34d; Nov 16, p 33; Nov 23, p 4; Nov 30, p 18; Dec 14, p 5
- Federal Steel Company, Testimony before Commission, Oct 26, p 34d
- Feed grinder, Campbell, Sep 7, p 42*
- Fence, Ornamental iron, Sep 21, p 11*
- Fence machine, Carter, Dec 14, p 34
- Fernley, T. J., Address of, Nov 23, p 44
- Ferry boats, Electric, Sep 14, p 16
- File sharpening, Electrolytic method, Nov 30, p 8
- Finance:
- Banking reform, Occasion for, Sep 28, p 14
 - Bankers on currency legislation, Sep 14, p 18
- Finance (continued):
- Bankruptcy law, Aug 10, p 3; Sep 28, p 8; Dec 7, p 2
 - Currency reform proposals, Dec 7, p 17
 - Full employment of capital, Oct 5, p 17
 - Gold exports and the end of silverism, Dec 21, p 19
 - Gold standard, July 20, p 16; Aug 3, p 18
 - Relieving the money market, Nov 16, p 17
 - Supplies of metallic and paper money, Oct 19, p 16
 - War and the gold supply, Oct 26, p 17
 - Why there is a plethora treasury, Nov 23, p 17
- Fires, Causes of, Sep 21, p 6
- Flouring mill, American, for China, Nov 16, p 1
- Fluctuations in prices of iron and steel, 1892-99, July 27, p 16
- Fluctuations in the prices of metals, 1890-99, Oct 26, p 14
- Flue cutter, Henrikson, Sep 21, p 9*
- Fly wheel design, Dec 14, p 15*
- Foley, Nelson, New method of forced draft, Aug 10, p 9
- Foot, J. D., Address of, Nov 23, p 53
- Forced draft, New Method, Aug 10, p 9*
- Foreign trade. (See Export Trade.)
- Forging machine, Rice, Aug 24, p 1*
- Forgings and the machines used in producing them, July 13, p 4
- Foundry building, Activity in, Oct 12, p 14
- Foundrymen's associations in closer connection, Nov 30, p 15
- Fox pipe cutting machine, Sep 28, p 11*
- Franco-American reciprocity treaty, Sep 21, p 7; Oct 5, p 9
- Franklin Institute celebration, Sep 28, p 9
- Franklin Machine Works, Aug 3, p 46
- Freight clearing house at Chicago, July 20, p 3
- Freight rates:
- Coke rates higher, Dec 28, p 34
 - Consolidations and freight rates, July 6, p 15
 - Heavy advance, Jan 1, Nov 23, p 19; Nov 30, p 34
 - Iron tariffs higher, Dec 28, p 23
 - Northwestern rates, July 27, p 36
 - Opposition from implement manufacturers, Dec 21, p 17
 - Pacific Coast rates, Nov 2, p 49
 - Postage stamp *vs.* graded rates, July 20, p 19; Oct 5, p 37
 - Shippers before Interstate Commerce Commission, Dec 28, p 11
- Friction shaper, Perkins, Sep 28, p 6*
- Frith, A. J., Note on fly wheel design, Dec 14, p 15*
- Fritz, John, Early rail making in the United States, Nov 16, p 5
- Frost Wire Fence Company, Aug 17, p 38; Aug 24, p 42
- Furnace, Hull Improved Bonanza, July 13, p 44*
- G.
- Gary, E. H., Testimony of, Oct 26, p 34d
- Gas engines:
- Blast furnace gas, July 6, p 6*; Aug 3, p 3*
 - Charter gasoline engine, July 6, p 12*
 - Lamos engines, Aug 24, p 13*
 - Westinghouse, Nov 2, p 1*
 - Woolley engines, Sep 7, p 7*
- Gas furnaces, Basic lined, for malleable casting manufacture, Nov 9, p 4; Nov 16, p 18
- Gas lamp, Imperial, Dec 28, p 46*
- Gas pipe outlet cutter, Sep 14, p 43*
- Gas producers:
- Duff, Legal decision, July 13, p 19
 - Wood 400 horse-power plant, Oct 26, p 1*
- Gases, Compression and liquefaction, Dec 28, p 13*
- Gates, John W., Before Industrial Commission, Nov 16, p 33
- Gibson, William, Address of, Nov 23, p 59
- Glass board, Lightning paneled, July 20, p 54*
- Glass cutting table, Aug 17, p 36*
- Globe banks, Aug 3, p 47*
- Globe holder, Ayres, Oct 26, p 48*
- Gold exports and the end of silverism, Dec 21, p 19
- Gold standard, Progress of, July 20, p 16; Aug 3, p 18; Sep 14, p 18
- Gold supply and the war, Oct 26, p 17
- Gordon, F. W., New system of valves for engines and compressors, July 13, p 7*
- Gorton grinding machine, Nov 2, p 9*
- Governors, Engine, Experiments upon the action of, Oct 26, p 10*; Nov 2, p 12*
- Graham, Malcolm, Death, Dec 21, p 41
- Graham, W. T., Address of, Nov 23, p 48
- Gray & Dudley Hardware Company, Aug 31, p 36
- Great Lake shipping, Dec 21, p 35
- Great wall of China, Sep 7, p 31
- Greece, Mining and engineering in, Aug 24, p 12
- Griffiths, W. H., Testimony before Industrial Commission, Nov 23, p 5
- Grinders:
- Cutlery and tool, Nov 16, p 50*
 - Lawn mower, Dec 28, p 47*
- Grinding machines:
- Defiance cup wheel, Aug 17, p 13*
 - Gorton disk grinder, Nov 2, p 9*
 - Leland & Faulconer, Sep 14, p 1*
 - Simplex lathe center grinder, Sep 7, p 9*
 - Sterling bench grinder, Oct 19, p 14*
- Grindstone, Velox ball bearing, Sep 7, p 42*
- Gruson cast iron turrets, Dec 28, p 1*
- Gun carriages, Disappearing, Government controversy, July 27, p 6
- Gun contracts, Government, July 6, p 13
- Guns:
- Cycloid air gun, Sep 14, p 43*
 - Government tests, Aug 3, p 31
- H.
- Hammers:
- Blacksmiths' power hammer, July 6, p 5*
 - Bradley compact, Oct 5, p 1*
 - Standard pneumatic, Nov 2, p 11*
- Hammock couch, Automatic swinging, July 13, p 41
- Hammocks:
- Lloyd woven wire, Aug 10, p 41*
 - Peerless wire, Sep 21, p 44*
- Handles:
- Farming tool, Prices, Oct 12, p 32
 - Sad iron, Aug 3, p 46*
 - Steel ball machine crank handles, Nov 2, p 11*
- Hangers, Cleveland, Sep 21, p 39*
- Harding *vs.* American Glucose Company, Oct 26, p 15, 18
- Hardware advertising. (See Advertising.)
- Hardware display figures, July 20, p 40*
- Hardware manufacturers' organization, Oct 5, p 37
- Hardware merchants, Organization of retail dealers, July 27, p 41
- Hardware prices for domestic trade, Aug 10, p 32
- Hardware store, Capital required to start, Dec 28, p 42
- Hardware trade:
- American hardware abroad, Sep 7, p 36; Sep 28, p 37; Nov 2, p 46
 - Australian matters, Nov 2, p 47, 48
 - Canadian advance, Dec 7, p 41
 - Effect of high prices on demand for goods, Nov 16, p 41; Nov 30, p 38
 - English trade, Sep 28, p 37; Nov 16, p 44
 - Florida conditions, Oct 19, p 43
 - Jewett's address, July 20, p 44
 - Letters from the trade, Dec 14, p 33
 - Michigan prices, Oct 26, p 43
 - Special brands, Nov 9, p 40
 - Unbusinesslike competition, Sep 7, p 37
- Harrison Safety Boiler Works, Nov 30, p 41*

Hatchet, Ott wire nail, Aug 3, p 46*
 Haulage methods in mining, Aug 24, p 13
 Havana Metal Wheel Company, Dec 21, p 42
 Heater, White hot blast, Oct 5, p 8*
 Heavy hardware conference at New Haven, July 13, p 38
 Heller Brothers Company, July 13, p 39; Aug 3, p 44
 Helwig pneumatic stay bolt clipper, Oct 12, p 9*
 Hemingway coking process, Aug 10, p 8; Sep 21, p 10
 Henrikson flue cutter, Sep 21, p 9*
 Hibbard, Spencer, Bartlett & Co., Nov 9, p 42; Dec 28, p 43
 Hibbins, W. G., Experiments upon the action of engine governors, Oct 26, p 10*; Nov 2, p 12*
 Hill, Hawthorne, Electric tramways and British industry, Nov 23, p 7
 Hilles & Jones Company, Oct 19, p 8
 Hinges:
 Hildenbrandt's double acting, Aug 31, p 39*
 Hoffman surface spring, Oct 26, p 49*
 Hoefler Mfg. Company, Oct 12, p 1*
 Holland submarine boat, Test of, Oct 12, p 9
 Hooks, Triumph steel, Nov 30, p 45*
 Horse clipping machine, Sep 28, p 44*
 Horseshoe, Hollow grip, Nov 9, p 50*
 Hot blast railway joint heater, Oct 5, p 8*
 Houghton & Buxton Mfg. Company, Aug 24, p 42
 Hull, M. L., July 13, p 44
 Hungerford Brass & Copper Company, July 13, p 43
 Huxley valve remodeling device, Oct 19, p 13*
 Hydrant, Peerless improved, Sep 14, p 43*
 Hydraulic engine, Johns, July 27, p 12*
 Hydraulic pump, Rice, Aug 31, p 1*

I.

Ice cream freezers, Queen and Pearl, Nov 23, p 66*
 Ice cycle, Aug 10, p 41*
 Ideal Mfg. Company, July 13, p 41
 Illinois anti-trust decision, Oct 26, p 15
 Illinois Retail Hardware Dealers' Association, July 13, p 35; Aug 10, p 35; Aug 24, p 34
 Illinois Steel Company:
 Bessemer Works, South Chicago, July 6, p 1*
 Concrete docks, Dec 14, p 1*
 Milwaukee plant, Dec 21, p 11
 Imperial Bit & Snap Company, July 6, p 43
 Imperial Steel Works of Japan, July 13, p 13
 Import trade, Tin Plate, 1890-99, Aug 31, p 8
 Industrial consolidations. (See Trusts.)
 Industrial growth of the United States, Oct 5, p 2
 Industrial stocks, July 6, p 16; Nov 16, p 18
 Ink well, Suspended, Oct 5, p 43*
 International Acetylene Association, July 20, p 13
 International Association for Testing Materials, Aug 24, p 31; Aug 31, p 17; Nov 23, p 14
 International Commercial Congress, Aug 31, p 8; Oct 12, p 16
 Interstate Commerce Commission, Aug 17, p 16; Dec 28, p 11
 Iowa Retail Hardware Dealers' Association, Sep 21, p 39

Iron:

Hardening iron, Aug 10, p 19
 On the use of finely divided iron ore obtained by concentrating processes, Sep 14, p 8
 Physical characteristics of malleable cast iron, Nov 9, p 4; Nov 16, p 18

Iron Age:

Advertising prize competition No. 1, July 6, p 37; July 13, p 40; July 20, p 39; Aug 3, p 42; Aug 10, p 38; Aug 17, p 34; Sep 14, p 39

Iron Age (continued):

Advertising prize competition No. 2, Aug 17, p 35; Sep 7, p 39; Oct 5, p 40*; Oct 19, p 44
 Standard Hardware Lists, July 6, p 41
 Iron and Steel Institute, July 27, p 14
 Iron famine, July 6, p 15
 Iron Molders' Union of North America, Action on use of molding machines, Aug 10, p 16; Aug 17, p 4
 Iron production:
 Alabama, Sep 21, p 12
 Atikokan range, Canada, Aug 3, p 13
 Austria, 1848-97, July 13, p 3
 Birkinbine's report for 1898, Aug 3, p 20
 Canada, 1898-99, July 6, p 12; Aug 17, p 7
 Charcoal iron industry, Oct 5, p 7
 Cuba, Aug 17, p 3
 Early iron making in Ohio, Nov 16, p 19
 Elba mines, Nov 16, p 12
 Great Britain, 1890, Sep 21, p 15
 Greece, Aug 24, p 12
 Increased production, July 13, p 20; Aug 10, p 18; Nov 9, p 22
 Jackson County, Ohio, Dec 7, p 11
 Lake district, July 6, p 27; July 20, p 15; July 27, p 9; Aug 10, p 5; Aug 17, p 14; Aug 24, p 9; Aug 31, p 6; Sep 7, p 8; Sep 21, p 12; Sep 28, p 8; Oct 12, p 6; Oct 26, p 21; Nov 2, p 18; Nov 9, p 19; Nov 16, p 6; Nov 23, p 15; Nov 30, p 12; Dec 28, p 18
 Midsummer statistics, July 27, p 7
 Minnesota ranges, Dec 14, p 30
 Pennsylvania, 1898, July 6, p 10
 Pig iron, Sep 14, p 21; Oct 12, p 20; Nov 16, p 16; Dec 14, p 19
 Swank's statistics, July 27, p 7
 World's production, Nov 16, p 6

Iron trade:

American and European prices, Aug 24, p 16
 American purchases in England, Sep 28, p 10
 Archer Brown on the outlook, Oct 5, p 6
 Cape Colony, 1898, July 20, p 10
 Changes in the pig iron trade, Dec 14, p 17
 Charcoal iron trade, July 27, p 15
 Concentration of ore interests, Aug 10, p 16
 English discount system, July 6, p 11
 English view of the iron situation, Oct 19, p 10
 English warrant market, Aug 31, p 7
 Exports, 1896-99, Aug 3, p 18
 Famine in pig iron, July 6, p 15
 Fluctuations in prices, 1892-99, July 27, p 16
 Great Britain's situation, Sep 21, p 16; Sep 28, p 10; Nov 9, p 35
 Lake freights on ore next year, Oct 19, p 16
 Lake ore mining activity, Dec 7, p 18
 Lumber prices and the iron trade, Sep 7, p 15
 New phases of the iron trade, Nov 16, p 8; Nov 23, p 18
 Pacific Coast, Aug 3, p 15; Aug 17, p 17; Aug 31, p 10; Sep 28, p 26; Oct 12, p 8; Oct 26, p 19; Nov 30, p 10; Dec 14, p 14; Dec 28, p 8
 Pennsylvania interests, July 20, p 33; Aug 3, p 32; Aug 10, p 7; Aug 31, p 3; Sep 21, p 14; Sep 28, p 9; Oct 12, p 10; Nov 16, p 4; Nov 23, p 16; Nov 30, p 16; Dec 7, p 8; Dec 14, p 11; Dec 21, p 18; Dec 28, p 17
 Pig iron prices, Oct 12, p 14
 Railroads and the iron trade, Dec 7, p 18
 Reforms in the trade, Aug 31, p 17
 Scotch warrant market, Aug 17, p 6
 Shortening of terms, Nov 2, p 19
 Stock panic and the iron trade, Dec 28, p 10
 Was it a mistake to advance prices slowly? Sep 7, p 15
 Ironville Hardware Association, Dec 7, p 43
 Isaac Walker Hardware Company, Nov 30, p 44

J.

Jackson County, Ohio, Iron industry of, Dec 7, p 11
 Jackson Knife & Shear Company, Dec 7, p 40
 Japan:
 Imperial Steel Works, July 13, p 13
 Tariff rates, July 20, p 8
 Jersey City depot of Pennsylvania Railroad, July 20, p 1*
 Jewett, C. G., Address, July 20, p 44
 Johns hydraulic engine, July 27, p 12*
 Jones, L. M., Company, July 13, p 40
 Judd, H. L., & Co., July 20, p 52

K.

Kearney & Trecker milling machine, Sep 7, p 11*
 Keen & Hagerty Mfg. Company, Dec 28, p 43
 Keene crimping and corrugating machine, Aug 10, p 5*
 Kelly adjustable crank shaper, Nov 16, p 7*
 Kelly steam plowing outfit, Aug 3, p 8*
 Killeen furnace skimmer and metal trough, Nov 16, p 13*
 Kirchhoff, Charles, New phases in the iron trade, Nov 16, p 8
 Knecht friction, sensitive drill, July 6, p 5*
 Knight, S. S., Iron industry of Jackson County, Ohio, Dec 7, p 11
 Knives:
 Mauser cartridge pocket knives, Oct 12, p 43*
 Miners' combination, July 6, p 43*
 Krueger, Theodor, Death of, Dec 14, p 41*

L.

Labor:

American manufacturer on labor and machinery, Aug 10, p 8
 Boiler makers' hours, July 27, p 15
 Chicago building trade, Nov 9, p 17; Nov 16, p 9, 17; Nov 23, p 3; Nov 30, p 13, 17; Dec 14, p 18
 Diminished output per capita, Aug 17, p 15
 Employees as stockholders, Nov 30, p 19
 English and American workmen, July 6, p 3
 English labor and holidays, Sep 7, p 8
 Labor unions not privileged, Oct 5, p 3
 Organizations of labor, Dec 21, p 19
 Organizations would destroy trusts, Dec 28, p 20
 Scarcity of workmen, Aug 3, p 17
 (See also Wages.)
 Ladder, Boyer windlass extension, Dec 14, p 47*
 Lake Iron ore matters, July 6, p 27; July 20, p 15; July 27, p 9; Aug 10, p 5; Aug 17, p 14; Aug 24, p 9; Aug 31, p 6; Sep 7, p 8; Sep 21, p 12; Sep 28, p 8; Oct 12, p 6; Oct 26, p 21; Nov 2, p 18; Nov 9, p 19; Nov 16, p 6; Nov 23, p 15; Nov 30, p 12; Dec 28, p 18
 Lake shipping, The struggle for, Oct 19, p 30d; Oct 26, p 18
 Lake Superior Power Company, Dec 14, p 29
 Lake Superior Steel Company, Sep 21, p 10
 Lalance & Grosjean Mfg. Company, Aug 24, p 11
 Lamos gas engines, Aug 24, p 13*
 Lamps:
 Acetylene gas, July 13, p 41*
 Automatic extinguisher and smokeless burners, July 27, p 45*
 Black incandescent vapor, Dec 21, p 46*
 Imperial gas lamp, Dec 28, p 46*
 Sunburst, Improved, Nov 16, p 47
 (See also Bicycle lamps.)
 Lanterns, Tubular glass fount, Aug 17, p 39*
 Latch, Perfection spring door, Dec 21, p 47*
 Lathe face plate, Skinner, Nov 30, p 11*
 Lathes:
 Cincinnati, Aug 3, p 7*

Lathes (continued):

- Electric motor buffing lathe and emery wheel, Nov 30, p 13*
- Engine lathe driven by Bullock motor, Oct 26, p 9*
- Fay & Scott turret lathe, Nov 16, p 1*
- Lavigne screw machine, July 13, p 1*
- Lawn mower grinder, Dec 28, p 47*
- Lawn mowers, Great American ball bearing, Nov 16, p 51*
- Lead prices, 1890-99, Oct 26, p 14
- Leland & Faulconer bevel gear grinding machine, Sep 23, p 1*
- Level, Adjustable cast iron, July 27, p 44*
- Lidgerwood derrick engine, Oct 19, p 12*
- Lightning Novelty Company, July 20, p 54
- Lightning tire setter and repair outfit, July 6, p 43*
- Link-Belt Engineering Company, Nov 30, p 14
- Liquefaction of gases, Dec 28, p 13*
- Locks:
- Albany design, Oct 5, p 44*
- Corbin, July 13, p 42*; Nov 16, p 48*
- (See also Sash locks.)
- Locomotive smoke nuisance, Oct 26, p 19
- Locomotives:
- American, for Swedish State railways, Aug 17, p 5
- Construction in 1899, Dec 28, p 19
- Lodge & Shipley Works, New, July 6, p 2
- Lodi Mfg. Company, Aug 17, p 38
- Louisville Retail Hardware and Stove Dealers' Association, Nov 2, p 44
- Loyhed, E. H., Combinations and trusts, July 6, p 39; July 20, p 50
- Lucas & Gliem machines, Aug 17, p 1*; Aug 31, p 9*; Nov 2, p 3*; Dec 7, p 1*
- Ludlow-Saylor Wire Company, Sep 21, p 11*; Oct 26, p 9
- Lumber prices, Sep 7, p 15; Dec 21, p 34
- Lupton, H. B., Address of, Nov 23, p 47

M.

Machine shops:

- Brooklyn Navy Yard, Aug 24, p 18
- Paris Exposition, Dec 14, p 12*
- Rebuilding, Aug 10, p 1*
- Machine tool business of France, Nov 30, p 41
- Machine tools, English, American and German tools, July 6, p 26
- Machinery trade, July 6, p 28, 29; July 13, p 29; July 20, p 30; July 27, p 29; Aug 3, p 32; Aug 10, p 27; Aug 17, p 26; Aug 24, p 28; Aug 31, p 27; Sep 7, p 27; Sep 14, p 31; Sep 21, p 30; Sep 28, p 28; Oct 5, p 26d; Oct 12, p 28c; Oct 19, p 30; Oct 26, p 33; Nov 2, p 33; Nov 9, p 33; Nov 16, p 32; Nov 23, p 32; Nov 30, p 30; Dec 7, p 32; Dec 14, p 31; Dec 21, p 32; Dec 28, p 31
- Magnet, The conceited, Sep 21, p 37
- Maher, W. H., Markham's last trip, Sep 28, p 40
- Mahoning iron mine, Nov 9, p 1*
- Malay States tin production, Nov 16, p 11
- Malleable cast iron, Physical characteristics, Nov 9, p 4; Nov 16, p 18
- Manchuria, Business situation, July 27, p 18
- Manufacturers' Contracting Company, Nov 23, p 2
- Marconi Wireless Telegraph Company of America, Nov 30, p 8
- Mare Island Navy Yard, Sep 21, p 8
- Markham's last trip, Sep 28, p 40
- Markt & Co. and export machinery trade, Oct 19, p 30c
- Massey Iron Company, Dec 28, p 43
- Match box, Searls, Sep 14, p 42*
- Mattox, A. H., Progress of the Paris Exposition, Nov 2, p 16
- Mattox, W. S.:
- American iron purchases in England, Sep 28, p 10
- American railway material abroad, Oct 26, p 20

Mattox, W. S. (continued):

- England's home demand, Sep 7, p 6
- English labor and holidays, Sep 7, p 8
- Scotch warrant market, Aug 17, p 6
- The antics of English warrants, Aug 31, p 7
- Welsh tin plate industry, Sep 21, p 14
- Mayhew, H. H., Company, July 13, p 41
- Mead, Charles L., Death of, Aug 24, p 40*
- Measure, Tea Cup, Dec 21, p 45*
- Mechanical stoker, Roney, Sep 28, p 1*
- Melville, G. W., Engineering in the United States, Dec 7, p 20
- Merchant marine, Subsidies to, Oct 19, p 10
- Meriden Bronze Company, Nov 16, p 47
- Metal Trades Association, Dec 7, p 31
- Mexican industries, Nov 9, p 7
- Mica, Canadian industry, Oct 12, p 19
- Michigan Hardware Association Convention, July 20, p 43
- Michigan mineral report, Nov 23, p 35
- Michipicoton ore fields, Nov 9, p 21
- Micrometers, Starrett, Oct 26, p 50*
- Mildred, Ill., Failure of, July 13, p 18
- Miller, Edward, & Co., Aug 10, p 40; Aug 31, p 38
- Miller, Z. T., Portrait, Aug 24, p 36*, 38
- Miller & Son on hardware advertising, July 13, p 37
- Milling machines:
- Kearney & Trecker, Sep 7, p 11*
- Sellers' combination, Nov 23, p 1*
- Milwaukee Foundrymen's Association, Sep 28, p 16; Nov 23, p 15
- Mine haulage methods, Aug 24, p 13
- Mineral production of U. S. in 1898, Aug 31, p 2
- Minnesota Retail Hardware Dealers' Mutual Fire Insurance Company, July 27, p 40
- Missouri Retail Stove and Hardware Dealers' Association, Dec 21, p 40
- Miter boxes, Hard wood, Dec 21, p 47*
- Molding machines, Action of Iron Molders' Union, Aug 10, p 16; Aug 17, p 4; Nov 9, p 17
- Money. (See Finance.)
- Monitors in service, Aug 31, p 14
- Moore, W. H., Testimony of, Oct 19, p 36
- Moore pneumatic traveling crane, Dec 21, p 14*
- Mouse trap, Metal choker, Aug 24, p 43*
- Myers, S. F., Company, Nov 30, p 44

N.

Nails:

- Cut nail of 1862, July 20, p 41
- Galvanized wire, Oct 5, p 42
- Rusting of wire nails, Sep 7, p 35
- Severance cut nail, Aug 24, p 10
- Napier, R. T., Riveting and calking ships, July 27, p 5
- National Association of Master Plumbers and the plumbing supply trade, Oct 5, p 16
- National bankruptcy convention, Chicago, July 13, p 18; Aug 3, p 2, 17
- National Cutlery Company, July 13, p 39
- National Cycle Mfg. Company, Nov 16, p 48
- National Export Exposition:
- Commercial Congress, Aug 31, p 8; Oct 12, p 16
- Exhibitors, Aug 31, p 4; Sep 21, p 19; Oct 19, p 13; Oct 26, p 4*; Nov 2, p 17; Nov 30, p 14*
- Merit of the exposition, Oct 12, p 14
- National Foundry Company, Nov 2, p 3
- National Hardware Association, Sep 14, p 37; Oct 12, p 28d; Nov 2, p 43; Nov 16, p 40; Nov 23, p 17, 43
- National Lead & Oil Company, Aug 10, p 7
- National Railroad Master Blacksmith's Association, Oct 5, p 5
- National Shear Company, Testimony before Industrial Commission, Nov 23, p 4
- National Steel Company:
- Blast furnace plant, Dec 21, p 1*
- Testimony before Federal Industrial Commission, Oct 19, p 35

- National Tin Plate Company, Nov 23, p 3
- National Tube Company, July 13, p 22; July 20, p 6; Sep 7, p 16
- Natural gas in Indiana, Sep 21, p 11
- Naval architects and marine engineers, Nov 23, p 8

Navy:

- Admiralty Board proposed, July 27, p 16
- Armor plate imbrogio, Dec 21, p 14
- Electric plants on war ships, Nov 23, p 11, 30
- Estimates for expenditures, Sep 7, p 18
- Melville's address, Dec 7, p 20
- Penalties for delays in delivery of war material, Aug 24, p 9
- Steel inspection, Nov 9, p 35
- Water tube boilers, Nov 23, p 9
- (See also War ships.)
- Navy yards:
- Discharging men in Brooklyn, Nov 30, p 12
- Machine shop equipment, Aug 24, p 18; Sep 21, p 8
- Machine tool bids, Oct 12, p 4, 17; Nov 30, p 7
- Power plant bids, Aug 10, p 19; Sep 21, p 8
- New Castle Shovel Company, Sep 7, p 40
- New Departure Bell Company, July 20, p 38; Aug 24, p 42; Aug 31, p 39; Sep 7, p 42*; Dec 28, p 45*
- New England Commercial Travelers, Nov 30, p 44
- New England Hardware Dealers' Association, Sep 21, p 37; Oct 19, p 41; Nov 16, p 40; Dec 7, p 43; Dec 21, p 40
- New England Iron and Hardware Association, July 20, p 38; Oct 12, p 37; Dec 21, p 40
- New Orleans resolutions, Oct 5, p 16
- New York Hardware Club, July 20, p 38
- New York Rapid Transit tunnel, Oct 19, p 1*
- New York Shipbuilding Company, July 6, p 12; July 27, p 4
- New York State Association of Hardware Jobbers, Sep 28, p 36
- Newman, J. H., Address of, Nov 23, p 53
- Newman, T. H., Portrait of, Nov 30, p 37*
- Niagara Falls Hydraulic Power & Mfg. Company, Aug 24, p 26
- Niagara Falls Power Company, Sep 28, p 7
- Niagara Mfg. Company, July 6, p 44
- Niagara River, Damming of, Oct 12, p 6
- Nickel steel, The age of, Nov 9, p 10
- Niles-Bement-Pond Company, Aug 17, p 28
- Niles Tool Works, Plate planing machine, Aug 24, p 11*
- North Dakota Retail Hardware Association, Dec 21, p 39
- Northern Electrical Mfg. Company, Nov 30, p 13*
- Norwalk Lock Company, Oct 5, p 44
- Norwood Bicycle Company, Nov 2, p 11
- Novelty Cutlery Company, July 6, p 43
- Novelty Iron Works, July 6, p 5
- Nut crack, Edwards adjustable, Sep 21, p 43*

O.

Obituaries:

- Ach, Abraham, July 27, p 17; Adams, J. W., Dec 21, p 20; Ames, Leonard, Nov 23, p 19; Ames, O. A., Sep 21, p 17; Sep 28, 36*; Andrews, George, Nov 2, p 20
- Bailey, C. L., Sep 7, p 17; Bailey, F. T., Dec 28, p 21; Barber, Robert, Aug. 10, p 17; Belden, R. A., Aug 17, p 17; Binnix, J. N., Oct 5, p 17; Blair, J. I., Dec 7, p 19; Blake, J. H., July 13, p 19; Brooke, H. L., Oct 12, p 21; Browne, W. C., Aug 31, p 17; Bunsen, R. W. E., Aug 24, p 17; Byers, A. M., Jr., Dec 21, p 21
- Castner, H. Y., Oct 19, p 17; Clapp, J. B., July 20, p 18, July 27, p 17; Coates, G. W., July 13, p 19; Cooke, William, Oct 5, p 17;

Obituaries (continued):

- Cramp, J. C., Oct 5, p 17; Cunningham, J. S., Dec 21, p 21
- Dawson, Sir William, Nov 23, p 18; Dickinson, W. E., July 13, p 19; Dodge, W. W., Sep 21, p 17; Dowland, Alfred, July 27, p 17; Durfee, W. F., Nov 23, p 19
- Eagle, S. F., Dec 14, p 35; Eckerts, George, July 13, p 19; Edwards, T. W., July 20, p 18
- Fairbairn, W. M., Nov 2, p 45*; Fearing, W. S., Oct 19, p 17; Frost, E. W., Aug 24, p 17
- Garrett, L. O., Nov 23, p 19; Graham, Malcolm, Dec 21, p 41; Guthrie, A. M., Dec 7, p 19
- Hackett, Patrick, Sep 7, p 17; Haff, E. P., July 6, p 16; Halmgreen, G. F. E., Nov 23, p 19; Hammond, Charles, Sep 14, p 32; Harman, P. S., Oct 19, p 17; Hebebrand, H. L., July 6, p 16; Hitchcock, W. J., Nov 23, p 18; Holley, S. H., July 13, p 19; Hyde, T. W., Nov 23, p 18
- Kelly, Charles, Nov 23, p 18; Kimball, C. H., Nov 23, p 18; Krueger, Theodor, Dec 14, p 41*
- Laue, P. P., Dec 14, p 35; Lewis, J. C., July 6, p 16; Long, J. A., July 6, p 16; Longstreth, Joseph, Aug 3, p 21; Lukens, L. A., Sep 28, p 17; Lym, G. W., Aug 31, p 17
- McGarvey, William, Dec 14, p 35; McKaig, A. L., Sep 14, p 32; Matthal, J. C., July 13, p 19; Mead, C. L., Aug 24, p 40; Moore, D. A., Nov 23, p 38; Morgan, J. W., Aug 3, p 21; Morris, Evan, Sep 7, p 17; Mulford, R. L., July 27, p 17; Murray, J. L., Aug 10, p 17; Myers, J. C., July 27, p 17
- Nelson, P. N., Sep 7, p 17
- Oliver, Ebenezer, Sep 14, p 32; Oothout, William, Aug 24, p 17; Osborne, R. B., Dec 7, p 19
- Parkes, W. B., Aug 10, p 17; Patterson, J. S., July 27, p 17; Pease, J. O., Oct 19, p 17; Pennypacker, M. J., Sep 14, p 32; Pierce, Walter, Sep 14, p 33; Plume, D. N., Sep 21, p 17; Potter, Charles, Dec 17, p 19; Priest, H. M., Sep 21, p 17; Pryor, E. J., July 20, p 18
- Ramsay, Robert, Aug 24, p 17; Rawle, Henry, Dec 14, p 35; Reis, J. W., Dec 21, p 21; Reynolds, S. M., Nov 2, p 20; Richardson, S. M., Aug 24, p 17; Rust, J. R., Sep 14, p 32
- Schoellkopf, J. F., Sep 21, p 17; Scully, D. J., Aug 17, p 17; Seaver, G. A., Oct 19, p 42*; Sessions, J. H., Sep 14, p 33; Shanley, Walter, Dec 21, p 20; Sharpe, Lucian, Nov 2, p 8; Shimer, S. M., July 27, p 17; Shivers, C. S., Dec 21, p 21; Solsson, John, Nov 23, p 19; Spogen, Antoine, Sep 14, p 32; Smith, H. S., Oct 26, p 7; Smyth, S. R., Nov 2, p 20; Stokes, Joseph, July 20, p 18; Strasser, F. A., Dec 21, p 20
- Tatham, W. P., Aug 10, p 17; Taylor, G. W. B., Nov 30, p 34; Taylor, J. D., Dec 28, p 21; Taylor, W. Y., Oct 12, p 21; Tillman, John, Aug 17, p 17; Trantor, James, Aug 24, p 17; Tritch, George, Oct 19, p 17, Oct 26, p 40*
- Vandergrift, J. J., Dec 28, p 21
- Wade, N. K., Nov 30, p 34; Wadsworth, C. F., Nov 23, p 18; Wallace, T. C., Dec 21, p 21; Webb, W. H., Nov 2, p 20; Wells, F. C., Sep 7, p 17; Welsh, T. W., Oct 19, p 17; Wheeler, C. Y., Sep 14, p 13; Williams, E. H., Dec 28, p 21; Winship, Robert, Sep 21, p 17; Woodwell, Joseph, Aug 31, p 33
- Ohio new steel plants, Oct 26, p 16
- Oliver, George T., Address of, Nov 23, p 59
- Oliver ore interests, Sep 14, p 12
- Oregon and Washington Retail Hardware Dealers' Association, Aug 24, p 39
- Ormsby ventilating system, Aug 17, p 7*

P.

- Pacific Coast news, Aug 3, p 15; Aug 17, p 17; Aug 31, p 10; Sep 28, p 26; Oct 12, p 8; Oct 26, p 19; Nov 30, p 10; Dec 14, p 14; Dec 28, p 8
- Pagan propeller, Dec 28, p 9*
- Paint strainer, McPherson, July 27, p 45*
- Palaces of foreign nations at Paris Exposition, Dec 7, p 5*
- Parcels post for Germany, Oct 19, p 46
- Paris Exposition:
- Fire protection, Sep 14, p 13
 - Machinery building, Dec 14, p 12*
 - Medal, Sep 7, p 4
 - Palace of foreign nations, Dec 7, p 5*
 - Progress of the exposition, Aug 3, p 19; Nov 2, p 16
 - United States pavilion, Aug 3, p 1*
 - Views of, July 6, p 9*, 11*
 - Weather Bureau exhibit, Nov 23, p 29
- Parsons steam turbine, Oct 19, p 7
- Patents in 1898-99, Aug 24, p 10
- Peck Brothers Company, Nov 2, p 7
- Peddlers' law, South Dakota, Aug 10, p 36
- Pennsylvania Malleable Company, Oct 5, p 15
- Perkins friction shaper, Sep 28, p 6*
- Personals, July 6, p 16; July 13, p 21; July 20, p 18; July 27, p 17; Aug 3, p 21; Aug 10, p 17; Aug 17, p 28; Aug 24, p 17; Aug 31, p 17; Sep 7, p 17; Sep 14, p 20; Sep 21, p 18; Sep 28, p 15; Oct 5, p 26b; Oct 12, p 16; Oct 19, p 30a; Oct 26, p 22; Nov 2, p 22; Nov 9, p 18; Nov 16, p 31; Nov 23, p 19; Dec 7, p 32; Dec 14, p 18; Dec 21, p 22; Dec 28, p 20
- Phenix Mfg. Company, July 13, p 43
- Philadelphia Foundrymen's Association, Sep 14, p 12; Oct 12, p 21; Nov 9, p 12
- Phoenix Bridge Company, Nov 30, p 14*
- Pig iron production, Sep 14, p 21; Oct 12, p 20; Nov 16, p 16; Dec 14, p 19
- Pike Mfg. Company, Oct 12, p 40
- Pipe:
- Red Jacket well pipe, Dec 7, p 49*
 - Seamless non-detachable collar, July 13, p 43*
- Pipe combination, Cast Iron soil pipe, July 13, p 12; July 20, p 20; July 27, p 29
- Pipe cutting machine, Fox, Sep 28, p 11*
- Pipe trust decision, United States Supreme Court, Dec 7, p 35
- Pipe wrench, Wright, Dec 28, p 47*
- Pittsburgh Coal Company, Aug 31, p 9; Oct 26, p 3
- Pittsburgh crucible steel plant, History of, Nov 30, p 8
- Pittsburgh Machine Tool Company, Oct 12, p 28c
- Pittsburgh Steel Hoop Company, Sep 7, p 26
- Pittsburgh Stove & Range Company, Oct 5, p 15
- Plate conveyor, Vollkommer, July 20, p 7*
- Plow making plant, Deere & Co., Sep 28, p 6
- Plowing outfit, Kelly steam, Aug 3, p 8*
- Plumbers' Trust, Memphis, Tenn., Dec 28, p 10
- Plumbing regulations, Chicago Nov 16, p 9
- Plumbing supply combination, Aug 10, p 12
- Plumbing supply trade, Fight in, Oct 5, p 16
- Pneumatic propulsion, July 20, p 14
- Pneumatic tool, Novel application, Oct 12, p 5*
- Poker, The philosophical, July 27, p 36
- Poland, Trade with, Nov 16, p 45
- Pooling by railroad companies, Aug 17, p 16
- Pope Mfg. Company:
- Bevel gear cutting machines, Sep 7, p 1*; Sep 14, p 1*; Sep 21, p 1*
 - Rice forging machine, Aug 24, p 1*
- Porter, R. P., Iron mines of Cuba, Aug 17, p 3
- Porto Rico, Tariff, Aug 31, p 11
- Portsmouth Navy Yard, Sep 21, p 8; Oct 12, p 4*

- Post hole diggers, Oct 19, p 50*
- Postage stamp vs. graded rail rates, July 20, p 19; Oct 5, p 37
- Postal abuses, Dec 7, p 10
- Postal scale, Pelouze, Nov 2, p 51*
- Powder measures, Universal, July 13, p 41*
- Power, Relative advantages of different kinds of power, July 20, p 9
- Premier Steel Works, Dec 14, p 14
- Press, Open back power, Sep 21, p 12*
- Price book, Vest pocket, Sep 28, p 39*
- Prices:
- American and European iron prices, Aug 24, p 16
 - Are present prices a criterion? July 13, p 17
 - Comparison of 1880 with 1899, Aug 24, p 41
 - Effect of high prices on demand for goods, Oct 12, p 33
 - Effect of trusts upon prices, Aug 17, p 12
 - Effect on foreign trade, Nov 2, p 48
 - Fluctuations in prices of iron, 1892-99, July 27, p 16
 - Fluctuations in prices of metals, 1890-99, Oct 26, p 14
 - Hardware trade, July 6, p 32, 34; July 13, p 32; July 20, p 34; July 27, p 33; Aug 3, p 36; Aug 10, p 30; Aug 17, p 29; Aug 24, p 32; Aug 31, p 31; Sep 7, p 32; Sep 14, p 34; Sep 21, p 33; Sep 28, p 33; Oct 5, p 30; Oct 12, p 29; Oct 19, p 37; Oct 26, p 37; Nov 2, p 38; Nov 9, p 36; Nov 16, p 37, 41; Nov 30, p 35; Dec 7, p 38; Dec 14, p 36; Dec 21, p 36; Dec 28, p 35
 - Iron and metal trades, July 6, p 19; July 13, p 23; July 20, p 24; July 27, p 21; Aug 3, p 24; Aug 10, p 21; Aug 17, p 20; Aug 24, p 21; Aug 31, p 20; Sep 7, p 21; Sep 14, p 24; Sep 21, p 24; Sep 28, p 20; Oct 5, p 21; Oct 12, p 23; Oct 19, p 24; Oct 26, p 25; Nov 2, p 24; Nov 9, p 25; Nov 16, p 25; Nov 23, p 23; Nov 30, p 23; Dec 7, p 25; Dec 14, p 22; Dec 21, p 25; Dec 28, p 25
 - List of tools, machines and hardware, Oct 5, p 34
 - Lumber prices and the iron trade, Sep 7, p 15
 - Next year's lake ore prices, Sep 14, p 19
 - No check to the advance, Oct 5, p 16
 - No danger of very low prices, Oct 26, p 17
 - Standard list prices for domestic trade, Aug 10, p 32
 - Was it a mistake to advance prices slowly? Sep 7, p 15
 - Problems in seeking foreign trade, Aug 31, p 16; Sep 28, p 13, 14; Nov 16, p 18
 - Propeller, Pagan adjustable, Dec 28, p 9*
 - Prosperity reduces per capita output, Aug 17, p 15
 - Pulleys:
 - Fox all steel sash, Aug 17, p 40*
 - Grand Rapids sash pulley, Dec 7, p 50*
 - Palmer all steel, Oct 5, p 44*; Oct 12, p 43* - Pullman and Wagner consolidation, Dec 7, p 29
 - Pump leathers, Sherman, Sep 21, p 42*
 - Pumping engines:
 - Bliss-Heath, Nov 30, p 9*
 - Cleveland engines, Dec 21, p 35 - Pumps:
 - Colonial double acting force pumps, Oct 12, p 44*
 - Rice high pressure, Aug 31, p 1* - Punching a plate, A curious experiment, Nov 9, p 9*
- Quincy Valve Mfg. Company, Oct 19, p 13
- R.
- Railroads:
- American railway material abroad, Oct 26, p 20
 - Bridge building, Aug 10, p 17

Railroads (continued):

- Building in 1899, Dec 28, p 9
 Chicago clearing house, July 20, p 3
 Construction for nine months, Oct 12, p 5
 Development in U. S., Aug 17, p 15
 Enormous volume of business, Oct 19, p 15
 Failures, Jan-June, 1899, July 13, p 14
 Iron trade and railroads, Dec 7, p 18
 Pennsylvania:
 Jersey City depot, July 20, p 1*
 Replacing large drawbridge, July 27, p 1*
 Pittsburgh & Lake Erie terminal, Dec 7, p 15
 Pooling favored by Knapp, Aug 17, p 16
 Receivers, The passing of, July 27, p 15
 Russia, Westinghouse brake, Aug 3, p 19
 Statistics for 1898, July 20, p 12
 Trans-Siberian, July 13, p 12
- Rails:
 Early rail making in U. S., Nov 16, p 5
 Experience with rails, Nov 9, p 18
 Raisin seeder. Perfection, Nov 2, p 50*
 Rake, Cronk wrought steel, July 13, p 41*
 Randolph-Clowes Company, Aug 3, p 35
 Range finders and range finding, Oct 5, p 11*
 Rating boilers, Oct 5, p 29
 Razor strop paste, Oct 12, p 42
 Razors in display case, Oct 5, p 43*
 Reading Hardware Company, July 27, p 40
 Receivers, The passing of, July 27, p 15
 Reciprocity treaty, Franco-American, Sep 21, p 7; Oct 5, p 9
 Reducing furnace for pulverulent ores, Sep 14, p 10*
 Reed Mfg Company, Aug 3, p 46
 Reeves, L. M., Portrait, Aug 24, p 36*, 38
 Reeves Iron Company, July 20, p 52
- Refrigerators:
 Gurney, Dec 21, p 46*
 Nickeloid, Dec 28, p 45*
 Reid, Daniel G., Testimony of, Oct 19, p 34
 Republic Iron & Steel Company, Sep 21, p 32; Nov 23, p 22; Nov 30, p 19
 Retail dealers, Organizations of, July 27, p 41
 Rice, A. L., Compression and liquefaction of gases, Dec 28, p 13*
 Rice, Charles De L.:
 Bevel gear cutting machine, Sep 21, p 1*
 Forging machine, Aug 24, p 1*
 High pressure pump, Aug 31, p 1*
 Riveting and calking ships, July 27, p 5
 Road conventions in Western States, Sep 28, p 15
 Roanoke West End Furnace, Sep 21, p 6
 Roaster, Savory, Oct 26, p 48*
 Roller skating, Revival in, Nov 16, p 45; Dec 28, p 43
 Roney mechanical stoker, Sep 28, p 1*
 Rocking cleat and nailer, Dec 21, p 45*
 Royal Steel & Iron Company, Nov 30, p 12
 Rubber tire situation, Aug 3, p 6
 Russell & Gradolph's advertising methods, Dec 28, p 39
 Russia, American trade with, Dec 7, p 42
 Rutland Fire Clay Company, Aug 31, p 36
- S.
 Sad iron handle, Aug 3, p 46*
 Saddle, Esmond, Nov 16, p 52*
 St. Louis Anti-trust Convention, Sep 28, p 5, 14
- Salesmen:
 Experiences of a traveling man, July 20, p 46
 Markham's last trip, Sep 28, p 40
 Sample warehouse in Shanghai, Nov 9, p 21
 Sanitary Ware Trust, July 13, p 2; Dec 14, p 7; Dec 28, p 18
- Samson Cordage Works, Aug 10, p 40
 Sao Paulo hydraulic plant, Oct 5, p 4
 Sargent Company's new works, Nov 9, p 8*
 Sash hangers, Acme, Sep 14, p 44*
 Sash locks:
 Burglar proof, Sep 7, p 41*
 New Century, Sep 7, p 44*
 Saw sets:
 Taintor Positive, Oct 5, p 45*
 Triumph, Nov 30, p 45*
 Saw tools, Simonds, Nov 23, p 65*
 Saws:
 Bishop butcher saw, Sep 21, p 44*
 Fay heavy swing cutting off, July 20, p 13*
 Scaling machine, Armor plate, Nov 9, p 13*
 Schaffer, T. J., Testimony of, Sep 28, p 3
 Scotch warrant market, Aug 17, p 6
 Scott-Janney Electric Company, Oct 26, p 32
 Scraper, Cabinet saw steel, Oct 5, p 46*
 Screw drivers:
 Leather handle, Nov 2, p 50*; Nov 23, p 65*
 Yankee ratchet, Aug 24, p 44*
 Screw machines:
 Bliss automatic, Oct 19, p 14*
 Lavigne, July 13, p 1*
 Seamless tube consolidation, Aug 10, p 28; Aug 17, p 14
 Searls Mfg. Company, Aug 17, p 38
 Seat lock, Mount Carmel, Sep 7, p 41*
 Seaver, George Arthur, Death of, Oct 19, p 42*
 Seavey Mfg. Company, July 13, p 40
 Sellers machine, Nov 23, p 1*
 Selling prices, Changing in a retail store, July 20, p 51; July 27, p 37; Aug 3, p 40; Aug 10, p 38
 Set screw protector, Canfield, July 20, p 54*
 "Shamrock," Strengthening for Atlantic voyage, Sep 7, p 30
 Shaper, Perkins friction, Sep 28, p 6*
 Sharpe, Lucian, Death of, Nov 2, p 8*
 Shaving set, Crown and Anchor, Dec 21, p 46*
 Shelby Steel Tube Company, Aug 10, p 28; Aug 17, p 14
 Shell for nitro powders, Peters, Aug 3, p 47*
 Sherman Mfg. Company, Sep 7, p 40
- Shipbuilding:
 American, 1898-99, July 6, p 28
 New plant on Delaware River, July 27, p 4
 Record of the year, Dec 14, p 10
 Shippers before the Interstate Commerce Commission, Dec 28, p 11
 Shipping on the Great Lakes, Dec 21, p 35
 Shipyard building slip, Nov 23, p 11*
 Siberia:
 Opening up of, July 20, p 12
 Trade conditions, July 27, p 18
 Silo cutter, Smalley, July 20, p 54*
 Simmons Hardware Company, Sep 21, p 39
 Simplex lathe center grinder, Sep 7, p 9*
 Skates:
 Ball bearing roller skate, Oct 26, p 49*
 Barney & Berry, Sep 21, p 41* Sep 28, p 45*
 Richardson ball bearing, Sep 28, p 44*
 Sled skates, Oct 19, p 49*
 Union hockey, Sep 14, p 42*
 Winslow, Aug 31, p 38*
 Skinner lathe face plate, Nov 30, p 11*
 Sloss-Sheffield Iron & Steel Company, July 20, p 12; Aug 3, p 31; Aug 10, p 28; Nov 16, p 19
 Smalley Mfg. Company, July 20, p 54
 Smith, A. A., Address of, Nov 23, p 54
 Smith, Horace S., Death, Oct 26, p 7*
 Smith, Oberlin, Strength of bicycle tubes, Aug 3, p 10
 Smoke prevention, Oct 5, p 29
 Society of Naval Architects and Marine Engineers, Nov 23, p 8
 Soil pipe plant, New, Oct 26, p 9
 South African hardware matters, Nov 2, p 46; Dec 28, p 40
 South Dakota Retail Merchants' Association, July 13, p 34
- Southern Indiana Retail Hardware Dealers' Association, Aug 17, p 36; Dec 28, p 37
 Special brands: the manufacturers' view, Nov 9, p 40
 Speculation, Business and stock, Dec 21, p 20
 Spelter, Collapse in, Nov 30, p 17
 Spokes for motor vehicles, Nov 16, p 59*
 Spray, Niagara bath, July 6, p 44*
 Stave tread, W. I. C., Sep 21, p 42*
 Standard Chain Company, Nov 16, p 40
 Standard list prices for domestic trade, Aug 10, p 32
 Standard Pneumatic Tool Company, Sep 14, p 14; Nov 2, p 11
 Standard steel classifications, Nov 16, p 31; Nov 23, p 20
 Stanley Works of New Britain, Dec 14, p 44
 Starrett, L. S., Company, Dec 21, p 42
 Stay bolt clipper, Pneumatic, Oct 12, p 9*
 Steam engines. (See Engines.)
 Steam navigation, Future and progress, Oct 5, p 10
 Steamships:
 Advance in ship values, Oct 5, p 15
 Australian freight route, Nov 2, p 47
 New York-San Francisco line, Nov 2, p 47
 Putting on a new bow, July 13, p 3
 Riveting and calking, July 27, p 5
- Steel:
 Bibliography of copper in iron and steel, Nov 30, p 5
 Color temperature, Dec 21, p 33
 Copper in steel, Nov 30, p 1*
 Cost of structural steel, Nov 6, p 3
 Fluctuations in prices, 1892-99, July 27, p 16
 Hardening steel, Aug 10, p 19
 History of a crucible steel plant, Nov 30, p 8
 History of manufacture in Sheffield, Oct 19, p 20
 Nickel steel, The age of, Nov 9, p 10
 Production:
 Great Britain, 1899, Sep 21, p 15
 Swank's statistics, July 27, p 7
 Steel arch, Moving large, July 20, p 1*
 Steel shavings, Dec 14, p 34
 Steel trade:
 Crucible steel situation, Sep 14, p 20
 Exports, 1896-99, Aug 3, p 18
 Sterling bench grinding machine, Oct 19, p 14*
 Sternbergh, J. H., Export of American iron and steel products, Oct 19, p 18
 Stetson, F. L., Testimony of, Oct 26, p 34d
 Stock waterer, Ball valve, Sep 14, p 42*
 Stoker, Roney mechanical, Sep 28, p 1*
 Stokes Brothers Company, Aug 3, p 44
 Store front guard, Oct 5, p 44*
 Stove, Toy ranges, Aug 3, p 48*
 Stove trade:
 Shortening of terms, Dec 28, p 8
 Uniform terms of sale, Nov 30, p 11
 Stover Mfg. Company, July 27, p 11; Sep 14, p 11
 Straightening machine, Hilles & Jones, Oct 19, p 8*
 Street railways, Detroit, July 6, p 16
 Strike, Foundrymen's, Pittsburgh, Nov 2, p 9
 Sturtevant, B. F., Company:
 Electric fan, Aug 10, p 11*
 Exhaust head, Oct 5, p 4*
 Subsidies to the merchant marine, Oct 19, p 10
 Supplee, W. W., Trip abroad, Sep 28, p 39
 Swing, Four-passenger, Dec 14, p 47*
 Swivel, Punching bag, Nov 30, p 45*
- T.
 Tapping machine, Anthony-Bates upright, July 6, p 8*
 Tariff:
 Canadian, July 13, p 39; Sep 28, p 12
 Cuban and Porto Rican, Aug 31, p 11; Sep 7, p 10
 Customs receipts for 1899, Oct 12, p 3
 Franco-American schedule, Sep 21, p 7; Oct 5, p 9

Tariff (continued):

Japanese tariff, July 20, p 8
 Tatam, S. C., Company, Aug 10, p 40
 Taylor, N. A., Testimony before Industrial Commission, Dec 14, p 5
 Telegraphy, Wireless, on Mont Blanc, Dec 28, p 22
 Telephony, Long distance, in U. S., Aug 31, p 13
 Tennessee Coal, Iron & Railroad Company, Steel plant, Dec 7, p 19
 Terminal of Pittsburgh & Lake Erie Railway, Dec 7, p 15
 "Terms, net cash, in thirty days," Sep 14, p 18
 Testing machine for bicycle tubes, Aug 3, p 10*
 Testing materials, International Association, Aug 24, p 31; Aug 31, p 17
 Thorite, the new explosive, Nov 23, p 4
 Thurston, R. H., The steam engine at the end of the nineteenth century, Dec 14, p 3
 Time recorder, Chicago autograph, July 20, p 53*
 Tin, Manipulation in pig tin, Aug 10, p 4
 Tin plate trade:
 Fluctuations in prices, 1890-99, Oct 26, p 14
 Malay States production, Nov 16, p 11
 Ten years' imports, Aug 31, p 8
 Welsh trade, Sep 21, p 14; Sep 28, p 4
 Tin plate wages, July 6, p 15; July 20, p 20; Sep 21, p 11
 Tin plate works, American, July 13, p 6
 Tire pumps:
 Gleason-Peters, Aug 10, p 42*; Aug 17, p 39*
 Graham foot pump, Nov 30, p 44
 Telescope pocket foot pump, Sep 28, p 44*
 Tire valve, Bown automatic, Nov 9, p 50*
 Toilet paper holder, Walker, Sep 14, p 41*
 Tool chests, Dec 14, p 48*
 Tools. (See Machine tools.)
 Tooth brush holder, Searls, Sep 14, p 42*
 Towel rack, Searls, Sep 21, p 44*
 Toy ranges, Aug 3, p 48*
 Trade. (See Export trade.)
 Trade-marks, Advice on, Nov 16, p 10
 Trade winning methods, July 6, p 36; July 13, p 37; July 20, p 39; July 27, p 38; Aug 3, p 41; Aug 10, p 37; Aug 17, p 33; Aug 31, p 34; Sep 7, p 39; Sep 14, p 38; Sep 21, p 38; Sep 28, p 38; Oct 12, p 38; Oct 19, p 44; Oct 26, p 41; Nov 9, p 44; Nov 16, p 46; Nov 23, p 39; Dec 7, p 44; Dec 14, p 42; Dec 28, p 38
 Traveling crane, Moore pneumatic, Dec 21, p 14*
 Treasury, United States, Nov 23, p 17
 Trenton Potteries Company vs. Richard Oliphant *et al.*, July 13, p 2
 Tricycle manumotor for cripples, Nov 16, p 48*
 Tritch, George, Death, Oct 26, p 40*
 Truck scale, Detroit, July 20, p 52*
 Trusts:
 Advantages of industrial consolidations, Nov 2, p 20
 Amalgamated Association and trusts, Sep 28, p 3
 Chicago Trust Conference, Sep 7, p 16; Sep 28, p 14
 Federal Industrial Commission investigation, Oct 19, p 31; Oct 26, p 34d; Nov 16, p 33; Nov 23, p 4; Nov 30, p 18; Dec 14, p 5
 Financial conditions changed, July 20, p 2
 Freight rates and consolidations, July 6, p 15
 Government directors on Trust Boards, Nov 30, p 17
 Illinois legal decision, Oct 26, p 15
 Industrial stocks, July 6, p 16; Nov 16, p 18
 Legal standing of trusts in Indiana, July 13, p 15

Trusts (continued.)

Loybed on combinations and trusts, July 6, p 39; July 20, p 50
 Merchant's views on consolidations of business interests, July 6, p 41
 New Jersey court decision, July 13, p 2
 Pipe trust decision, U. S. Supreme Court, Dec 7, p 35
 St. Louis Anti-Trust Convention, Sep 28, p 5, 14
 Tube bending machine, Condon, Oct 12, p 7*
 Tucker & Dorsey Mfg. Company, July 13, p 40
 Turbines:
 Delaval steam, Nov 2, p 2
 Parsons steam, Oct 19, p 7
 Turrets, Gruson cast iron, Dec 28, p 1*
 Tyler Charcoal Iron Tin Mills, Dec 14, p 13

U.

Union Hardware Company, Aug 31, p 38
 Union Steel & Chain Company, Aug 24, p 30; Aug 31, p 19
 Union Steel Company of Pittsburgh, Nov 16, p 22; Dec 14, p 34
 United States, Industrial growth of, Oct 5, p 2
 United States Lock Company, Nov 30, p 44
 Universal Fuel Company, Sep 21, p 10
 Utah lignite, Nov 2, p 6
 Utilization of furnace gas for power, July 6, p 6*; Aug 3, p 3*
 Utilization of waste, Aug 10, p 10

V.

Valve remodeling device, Huxley, Oct 19, p 13*
 Valves:
 Brindley hydraulic working, Oct 12, p 12*
 Collis circulating valve, Oct 12, p 13*
 New system for engines and compressors, Gordon, July 13, p 7*
 Variety Machine Company, Aug 17, p 38
 Ventilating system, Ormsby, Aug 17, p 7*
 Virginia Iron, Coal & Coke Company, Aug 3, p 2; Oct 12, p 28b
 Vise for irregular work, July 13, p 13*
 Vollkommer, Josef, Manufacture of enamels, Aug 10, p 6; Aug 17, p 9
 Vollkommer plate conveying apparatus, July 20, p 7*

W.

Wages:
 City and country workmen, July 27, p 15
 Coke workers, July 20, p 33
 England, 1898, Oct 26, p 22
 Puddlers dissatisfied, Sep 21, p 17
 Tin Plate, July 6, p 15; July 20, p 20; Sep 21, p 11
 (See also Labor.)
 Wagon, Hardware delivery, Dec 7, p 50*
 Wainford pig casting machine, Aug 31, p 15
 Waiting: a poem, Sep 14, p 40
 Walker magnetic chucks, July 27, p 8*
 War and the gold supply, Oct 26, p 17
 War Department and contractors, Nov 9, p 20
 Ware, A. B., Advertising methods, Dec 28, p 38
 Warrants, English and Scotch, Aug 17, p 6; Aug 31, p 7
 War ships:
 Bids for new cruisers, Nov 9, p 11
 Construction order, New, by Secretary Long, Aug 3, p 35
 Electric plants on, Nov 23, p 11, 30
 Melville's address, Dec 7, p 20
 Monitors in service, Aug 31, p 14
 New vessels, July 27, p 14; Sep 14, p 31
 (See also Navy.)

Washing machines:

Chief washer, Sep 28, p 45*
 Horton rotary, Nov 9, p 49*
 Sterling duplex, Dec 14, p 47*
 Washtub, Galvanized, Sep 28, p 46*
 Waste, Utilization of, Aug 10, p 10
 Watchman's time detector, Nov 2, p 51*
 Water filter, Perfection rain, Sep 7, p 41*
 Water power, Tiete River, Brazil, Oct 5, p 4
 Waterbury Rope Company, July 13, p 39
 Weather Bureau exhibit at Paris, Nov 23, p 29
 Weber, H. W., Portrait, July 20, p 44*, 48
 Weeder, Rapid-easy, Sep 21, p 44*
 Welsh tin plate industry, Sep 21, p 14; Sep 28, p 4
 Westinghouse brake in Russia, Aug 3, p 19
 Westinghouse Machine Company:
 Foundry and forge plants, Oct 12, p 17; Nov 16, p 10
 Gas engines for motive power, Nov 2, p 1*
 Weston Electrical Instrument Company, New building, July 13, p 5*
 Wesphalia, Basic open hearth process, Sep 7, p 3
 Wheeler, C. Y., Death, Sep 14, p 13*
 Wheeler, E. C., Physical characteristics of malleable cast iron, Nov 9, p 4
 White, Maunsel, and F. W. Taylor, Colors of heated steel corresponding to different temperatures, Dec 21, p 33
 White hot blast railway joint heater, Oct 5, p 8*
 Whiting crane, Nov 2, p 7*
 Whittling, An exhibition of, Dec 21, p 42*
 Wilburgh, J., On the use of finely divided iron ore obtained by concentrating processes, Sep 14, p 8
 Williams, H. J., The age of nickel steel, Nov 9, p 10
 Wilson, F. C., Acetylene lighting, Nov 30, p 21
 Wind mill and the reporter, Aug 3, p 43
 Window displays:
 Fourth of July, Aug 10, p 37*
 Shooting season display, Dec 28, p 39
 Window fixtures:
 New Century Mfg. Company, Sep 7, p 44*
 Phenix Mfg. Company, July 13, p 43*
 Whaley-Dwyer Company, July 27, p 46*; Aug 3, p 46*
 Willer Mfg. Company, Oct 12, p 42
 Winter, R. G., Oct 12, p 43*
 Windows, Defender Safety, Sep 21, p 46*
 Wisconsin Retail Hardware Association, Aug 3, p 39
 Withington, W. H., Address of, Nov 23, p 48
 Witte Hardware Company, Oct 12, p 37
 Wood drill, Monarch pneumatic, Sep 21, p 13*
 Wood gas producer plant, Oct 26, p 1*
 Woodstock consolidation, Dec 14, p 30
 Woodwell, Joseph, Death, Aug 31, p 33*
 Woolley gas engines, Sep 7, p 7*
 Workingmen. (See Labor.)
 Wrenches:
 Mossberg bicycle wrench, Aug 17, p 38*
 Springfield bicycle wrench, Sep 7, p 43*
 Triumph, Dec 21, p 47*
 Wright pipe wrench, Dec 28, p 47*

Y.

Yale & Towne Mfg. Company, Aug 3, p 46; Aug 10, p 39; Sep 14, p 15*
 Yarrow, A. F., Nickel steel versus mild steel boiler tubes, Aug 10, p 12*

Z.

Zinc ore prices, Oct 12, p 15

ACCT
Be
Llo
Fru
Me
Mo
Nih
Ph
Wa
Wa
R.
ACC
Ed
Wa
ACE
Ac
ACE
La
ACI
III
ACT
Ac
ACT
III
M
ADJ
In
ADJ
M
R
V
ADJ
R
R
ADJ
H
C
ADJ
C
ADJ
H
T
ADJ
F
ADJ
L
ADJ
AG
J
AG
J
F
J
S
AG
S
AG
F
F
J
D
J
F
I
C
S
T
V

INDEX TO ADVERTISING PAGES.

ACCUMULATORS, Hydraulic—

Bement, Miles & Co., Philadelphia, Pa.
Lloyd Booth Co., Youngstown, O.
Frank-Kneeland Mch. Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Niles Tool Works Co., Hamilton, O.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Ct.
Watson-Stillman Co., 204-210 E. 43d St., New York.
R. D. Wood & Co., Philadelphia, Pa.

ACCUMULATORS, Steam—

Edw. P. Allis Co., Milwaukee, Wis.
Watson-Stillman Co., 204-210 E. 43d St., New York.

ACETYLENE BURNERS—See Burners, Acetylene.

ACETYLENE LAMPS, LANTERNS—See Lamps, Lanterns, Acetylene.

ACID PHOSPHATE—

Illinois Zinc Co., Peru, Ill.

ACID PROOF ENAMELS—See Enamels, Acid Proof and Cast Iron.

ACID, Sulphuric—

Illinois Zinc Co., Peru, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

ADJUSTABLE BLOCKING—See Blocking, Adjustable.

ADJUSTERS, Blind—

Millers Falls Co., 28 Warren St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Van Wagoner & Williams Hardware Co., Cleveland, O.

ADJUSTERS, Casement—

Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

ADJUSTERS, Hammock Rope and Hitching Strap—

Covert's Saddlery Works, Farmer, N. Y.

ADJUSTERS, Shaft and Pole—

Covert's Saddlery Works, Farmer, N. Y.

ADJUSTERS, Window Stop—

Hobart B. Ives Co., New Haven, Ct.
Taplin Mfg. Co., Forestville, Ct.

ADVERTISING WRITER.

Francis I. Maule, Philadelphia, Pa.

ADZES—

L. & I. J. White Co., Buffalo, N. Y.

ADZES, ICE—See Ice Harvesting Tools.

AGENTS, Bicycle Material, &c.—

John S. Leng's Son & Co., 4 Fletcher St., New York.

AGENTS, Bicycle Sundries—

John H. Graham & Co., 113 Chambers St., New York.
Hartley & Graham, 313 Broadway, N. Y.
John S. Leng's Son & Co., 4 Fletcher St., New York.
Schoverling, Daly & Gales, 302-304 Broadway, New York.

AGENTS, Clock—

S. F. Myers Co., 48 & 50 Malden Lane, New York.

AGENTS, Hardware Manufacturers—

Hermann Boker & Co., 101 Duane St., N. Y.
Burditt & Williams, Boston, Mass.
John Chatillon & Sons, 85 Cliff St., N. Y.
Dame, Stoddard & Kendall, Boston, Mass.
John H. Graham & Co., 113 Chambers St., New York.
Hartley & Graham, 313 Broadway, N. Y.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Charles Millar & Son, Utica, N. Y.
Shelby & Co., London, E. C., England.
Tower & Lyon, 95 Chambers St., New York.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

AGENTS, Machinery—

Manning, Maxwell & Moore, 85 Liberty St., New York.

AGRICULTURAL BOLTS, SHAPES—See Bolts, Shapes.

AGRICULTURAL CHAINS—See Chains, Agricultural.

AGRICULTURAL MACHINERY—

Consolidated Railway Electric Lighting & Equipment Co., Derby, Ct.
Ney Mfg. Co., Canton, O.

AIR CHAMBERS, Seamless Copper—

Naugatuck Mfg. Co., Naugatuck, Ct.

AIR GAUGES—See Gauges, Air.

AIR RECEIVERS, TANKS—See Receivers, Tanks.

ALARM WHISTLES—See Whistles, Alarm.

ALARMS, Electric—

W. R. Ostrander & Co., 22 Dey St., N. Y.

ALLEYS, Bowling—

Narragansett Machine Co., Providence, R. I.

ALTAR BELLS—See Bells, Altar and Lodge.

ALUMINUM—

Theodore Hofeller & Co., Buffalo, N. Y.
Janney, Steinmetz & Co., Philadelphia, Pa.
Pittsburgh Reduction Co., Pittsburgh, Pa.
Scovill Mfg. Co., Waterbury, Ct.

ALUMINUM BARS, CASTINGS, &c.—See Bars, Castings, &c.

AMMETERS—

General Electric Co., Schenectady, N. Y.

AMMONIA FITTINGS—See Fittings, Ammonia.

AMPERE RECORDING METERS—See Meters, Ampere Recording.

ANCHOR BOLTS—See Bolts, Anchor.

ANCHORS, Building—

Wm. Bailey & Sons Co., Milwaukee, Wis.
Belmont Iron Works, Philadelphia, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St., & 11th Ave., New York.
John C. Kupferle, St. Louis, Mo.
Pierson & Co., 29 Broadway, New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

ANCHORS, Ship, Boat, &c.—

W. & J. Tiebout, 118 Chambers St., N. Y.

ANDIRONS—

Murdock Parlor Grate Co., Boston, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
R. W. Whitehurst & Co., Norfolk, Va.

ANEMOMETERS—

B. F. Sturtevant Co., Boston, Mass.

ANGLE BARS—

Brown & Co., Inc., Pittsburgh, Pa.
Illinois Steel Co., Chicago, Ill.
Republic Iron & Steel Co., Chicago, Ill.

ANGLE BORING BIT STOCK—See Bit Stock, Angle Boring.

ANGLE KNIVES—See Knives, Angle.

ANGLES AND TEES—

American Steel Hoop Co., Pittsburgh, Pa.
Belmont Iron Works, Philadelphia, Pa.
Danville Bessemer Co., Danville, Pa.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.

Lockhart Iron & Steel Co., Pittsburgh, Pa.
Ogden & Wallace, 577 Greenwich St., N. Y.
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Republic Iron & Steel Co., Chicago, Ill.
A. & P. Roberts Co., Philadelphia, Pa.
Statler-Bischoff Co., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

ANGLE SETTERS—See Setters, Frame or Angle.

ANIMAL CAGES, POKES, TETHERS, WEANERS—See Cages, Pokes, Tethers, Weaners.

ANNEALING—

I. S. Spencer's Sons, Gullford, Ct.

ANNUNCIATOR WIRE—See Wire, Annunciator.

ANNUNCIATORS—

W. R. Ostrander & Co., 22 Dey St., N. Y.

ANTI-FRICTION METAL—

Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.
Theo. Hertz & Son, St. Louis, Mo.
Magnolia Metal Co., 266 and 267 West St., New York.
Merchant & Co., Philadelphia, Pa.
Phosphor Bronze Smelting Co., Philadelphia, Pa.
Q. & C. Company, Chicago, Ill.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.
S. Shonberg, 172 Hudson St., New York.

ANTIMONY—

American Metal Co., 52 Broadway, N. Y.
John Davol & Sons, 100 John St., N. Y.
Hendricks Bros., 49 Cliff St., New York.
Theo. Hertz & Son, St. Louis, Mo.
Merchant & Co., Philadelphia, Pa.
Arthur T. Rutter, 256 Broadway, N. Y.
J. J. Ryan & Co., Chicago, Ill.

ANTI-RATTLERS, Carriage or Thill—

Boston Belting Co., Boston, Mass.
W. R. Hartigan, Collinsville, Ct.
F. E. Kohler & Co., Canton, O.

ANTI-RATTLERS, Thill Coupling—

Sabin Machine Co., Montpelier, Vt.

ANTI-RATTLERS, Window—

J. T. Henry Mfg. Co., Hamden, Ct.

ANTI-SCALE PREPARATIONS—

Smooth On Mfg. Co., Jersey City, N. J.

ANVIL AND VISE—

Eagle Anvil Works, Trenton, N. J.
Fulton Iron & Engine Works, Detroit, Mich.
Janesville Hay Tool Co., Janesville, Wis.

ANVIL, DRILL AND VISE—See Vise, Drill and Anvil.

ANVILS—

Columbus Forge & Iron Co., Columbus, O.
Eagle Anvil Works, Trenton, N. J.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Hollands Mfg. Co., Erie, Pa.
Lewis Tool Co., 44 Barclay St., New York.
Millers Falls Co., 28 Warren St., New York.
Sandwich Enterprise Co., Sandwich, Ill.
Van Wagoner & Williams Hardware Co., Cleveland, O.
Wrightsville Hardware Co., Wrightsville, Pa.

APPLE CORERS AND PARERS—See Parers, Apple.

APPRAISERS AND AUDITORS—

American Appraisal Co., 804 Park Row Building, New York.

APRON CARRIERS, ENDLESS—See Carriers, Apron.

ARBORS, Circular Saw—

American Tool Works Co., Cincinnati, O.
E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Pittsburgh, Mass.
T. F. Welch Mfg. Co., Boston, Mass.
Wickes Bros., Saginaw, Mich.

ARBORS FOR DRILL CHUCKS—

Standard Tool Co., Cleveland, O.

ARBORS FOR SHELL REAMERS—

Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.
Standard Tool Co., Cleveland, O.

ARBORS—See Mandrels.**ARCHES, Curved Corrugated—**

Cincinnati Corrugating Co., Piqua, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Wm. B. Sealife & Sons, Pittsburgh, Pa.
Youngstown Iron & Steel Roofing Co., Youngstown, O.

ARC LAMPS—See Lamps, Arc.**ARC LIGHT ROPE—See Wires, Electrical.****ARMATURE BINDING WIRE—See Wires, Electrical.****ARMATURE DISC NOTCHING MACHINES—See Notching Machines, Armature Disc.****ARMATURE DISCS—See Discs, Armature.****ARMATURE SHEETS—**

Apollo Iron & Steel Co., Pittsburgh, Pa.

ARMOR—

Bethlehem Steel Co., S. Bethlehem, Pa.

ARMY AND NAVY SCALES—See Scales, Army and Navy.**ARRESTERS, Lightning—**

General Electric Co., Schenectady, N. Y.

ARRESTERS, Spark—

Littleford Bros., Cincinnati, O.
Fred. J. Meyers Mfg. Co., Hamilton, O.

ARTESIAN WELL PUMPS—See Pumps, Artesian Well.**ARTESIAN WELL SUPPLIES AND TOOLS—See Well Supplies and Tools.****ASBESTOS PLASTER, ROOFING, &c.—See Plaster, Roofing, &c.****ASH CANS, SIEVES, SIFTERS—See Cans, Sieves, Sifters.****ASH PAN EARS—See Ears, Ash Pan and Kettle.****ASH TRAPS, GRATE—See Grate Ash Traps.****ASSEMBLING MACHINES, Bicycle Wheel—**

Garvin Machine Co., Spring and Varick St., New York.
Pratt & Whitney Co., Hartford, Ct.

ATTACHMENTS, PIPE WRENCH, SQUARE—See Wrenches, Squares.**ATTORNEYS—**

Creditors' Legal Union, 302 Broadway, New York.

AUCTIONEERS—

E. Bissell & Co., 12 Murray St., New York.

AUDITORS—See Appraisers and Auditors.**AUGER HANDLES—See Handles, Auger.****AUGERS AND BITS—**

Bridgeport Gun Implement Co., 313 Broadway, New York.
Connecticut Valley Mfg. Co., Centerbrook, Ct.
Ford Bit Co., Holyoke, Mass.
John H. Graham & Co., 113 Chambers St., New York.
C. E. Jennings Co., 101 Reade St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell Jennings Mfg. Co., Deep River, Ct.
Job T. Pugh, Philadelphia, Pa.
Snell Mfg. Co., Fiskdale, Mass.

AUGERS, Dried Fruit and Sugar—

Enterprise Mfg. Co., Philadelphia, Pa.

AUGERS, Hollow—

Millers Falls Co., 28 Warren St., New York.
Silver Mfg. Co., Salem, O.

AUGERS, ICE—See Ice Harvesting Tools.**AUTOGRAPHIC CASH RECORDERS—See Recorders, Cash Autographic.****AUTOMOBILE PARTS—**

Billings & Spencer Co., Hartford, Ct.

AUTOMOBILES—

Daimler Mfg. Co., Long Island City, N. Y.

AUTOMOBILE SUPPLIES—

Boston Gear Works, Boston, Mass.

AUTOMOBILE WORK TO ORDER—

U. S. Projectile Co., Brooklyn, N. Y.

AWL HANDLES—See Handles, Chisel, File, Awl, &c.**AWLS, ICE—See Picks and Awls, Ice.****AWLS, Lace Leather—**

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

AWLS, Peg, Brad, &c.—

New England Specialty Co., North Easton, Mass.
Stanley Rule & Level Co., New Britain, Ct.
Star Heel Plate Co., Newark, N. J.

AWLS, Scratch, Belt, &c.—

Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings & Spencer Co., Hartford, Ct.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
H. H. Mayhew Co., Shelburne Falls, Mass.
Millers Falls Co., 28 Warren St., New York.
Niagara Machine & Tool Works, Buffalo, N. Y.
Norton Mfg. Co., Chester, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Springfield Machine Screw Co., Springfield, Mass.
Tuck Mfg. Co., Brockton, Mass.

AWNING HARDWARE—

W. & J. Tiebout, 118 Chambers St., N. Y.

AWNING HINGES, HOOKS, PULLEYS—See Hinges, Hooks, Pulleys.**AWNINGS, Iron—**

Cincinnati Corrugating Co., Piqua, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Garry Iron & Steel Roofing Co., Cleveland, O.
Stewart Iron Works, Cincinnati, O.

AXE BRACKETS, RACKS, STONES—See Brackets, Racks, Stones.**AXES, Chopping—**

Ferro-Carbon Casting Co., Philadelphia.
L. & I. J. White Co., Buffalo, N. Y.

AXES, Ice—

Peter Gerlach & Co., Cleveland, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. & I. J. White Co., Buffalo, N. Y.
Wm. T. Wood & Co., Arlington, Mass.

AXLE CLIPS, CUTTERS, GREASE, &c.—See Clips, Cutters, Grease, &c.**AXLE GREASE BOXES—See Boxes, Axle Grease.****AXLE IRON—See Iron, Axle.****AXLE STRAIGHTENING PRESSES—See Straightening Presses, Axle.****AXLES AND WHEELS—**

Atlas Bolt & Screw Co., Cleveland, O.
Havana Metal Wheel Co., Havana, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Thomas Carlin's Sons, Allegheny, Pa.

AXLES, Car—

Atlas Bolt & Screw Co., Cleveland, O.
Cleveland City Forge & Iron Co., Cleveland.
Eastern Forge Co., Boston, Mass.
Frankfort Steel Co., Ellwood City, Pa.
Jones & Laughlin, Ltd., Pittsburgh, Pa.
Keagy & Lear Machine Co., Coshocton, O.
La Belle Steel Co., Pittsburgh, Pa.
Otis Steel Co., Limited, Cleveland, O.
Pierson & Co., 29 Broadway, New York.
Republic Iron & Steel Co., Chicago, Ill.
A. & P. Roberts Co., Philadelphia, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.

AXLES, Wagon and Carriage—

Concord Axle Co., Penacook, N. H.
Keagy & Lear Machine Co., Coshocton, O.
La Belle Steel Co., Pittsburgh, Pa.
Parry Mfg. Co., Indianapolis, Ind.
Singer, Klumick & Co., Pittsburgh, Pa.
F. W. Wurster & Co., Brooklyn, N. Y.

BABBITT METAL—

Chas. H. Besly & Co., Chicago, Ill.
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
Fairbanks Co., 311 Broadway, New York.
Theo. Hiertz & Son, St. Louis, Mo.
Theodore Hofeller & Co., Buffalo, N. Y.
Lorain Foundry Co., Lorain, O.
Magnolia Metal Co., 266 & 267 West St., New York.
Markle Lead Works, St. Louis, Mo.
Merchant & Co., Philadelphia, Pa.
F. R. Phillips' Sons Co., Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.
H. M. Shimer & Co., Philadelphia, Pa.
I. Shonberg, 172 Hudson St., New York.

BACK SAWS—See Saws, Hand, Panel, Back, &c.**BADGES AND MEDALS—**

American Railway Supply Co., St. Louis.
L. A. Eucker Stamp Works, Little Ferry, N. J.
Schwerdtle & Siebert, Bridgeport, Ct.
R. Woodman Mfg. & Supply Co., Boston.

BAG FILERS, HOLDERS, LOCKS—See Fillers, Holders, Locks.**BAGGAGE CHECKS—See Checks, Baggage, Key, &c.****BAGS, Game—**

Waterbury Brass Co., Waterbury, Ct.

BAGS, Rubber—

Peerless Rubber Mfg. Co., 16 Warren St., New York.

BAGS, School—

I. E. Palmer, Middletown, Ct.

BAKERS' AND CONFECTIONERS' TOOLS, Machines, &c. (Ovens, Yeast Buckets, Pie, Racks, Scrapers, Basins, Cake Pans, Cake Cutters, Steves, &c.)—

V. Clad & Sons, Philadelphia, Pa.
J. W. Ruger Mfg. Co., Buffalo, N. Y.

BAKING PANS—See Pans, Baking and Roasting.**BALANCES AND SCALES, Assay—**

Fairbanks Co., 311 Broadway, New York.

BALANCES, Sash—

Caldwell Sash Balance Co., Rochester, N. Y.
Coleman Hardware Co., Chicago, Ill.
Pullman Sash Balance Co., Rochester, N. Y.
N. R. Streeter & Co., Rochester, N. Y.

BALANCES, Spring—

Bridgeport Brass Co., Bridgeport, Ct.
John Chatillon & Sons, 85 Cliff St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

BALE BOXES, TIES—See Boxes, Ties.**BALES, Kettle—**

Troy Nickel Works, Albany, N. Y.

BALING WIRE—See Wire, Baling.**BALL FLOATS, COPPER—See Floats, Copper Ball.****BALL JOINTS—See Joints, Ball.****BALLING IRONS—See Irons, Balling.****BALLOTS, Society—**

H. O. Canfield, Bridgeport, Ct.

BALLS, Fuller Rubber—

H. O. Canfield, Bridgeport, Ct.

BALLS, Ox—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

BALLS, Steel—

Ball Bearing Co., Boston, Mass.
Boston Gear Works, Boston, Mass.
Cleveland Ball & Screw Co., Cleveland, O.
Dodge Machine Screw Co., Boston, Mass.

BALLS, Ten Pin—

Boston & Lockport Block Co., Boston.
John Sommer's Son, Newark, N. J.

BAND CHIMES—See Chimes, Church and Band.**BAND CUTTER AND NAIL PULLER—See Nail Puller and Band Cutter.****BAND IRON—See Hooks, Iron.****BAND SAWS—See Saws, Band.****BAND SAWS FOR METAL—See Saws, Band, for Metals.****BAND SAW, STEEL—See Steel Saw, Band.****BANDS, GAFF—**

W. & J. Tiebout, 118 Chambers St., N. Y.

BANDS, HOSE—See Hose Attachments.**BANDS, Hub—**

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

BANDS, Vehicle Wheel, Sand and Mud—

Concord Axle Co., Panacook, N. H.

BANQUET LAMPS—See Lamps, Table, Banquet, &c.**BARBERS' SHEARS—See Shears, Barbers'.****BARBING MACHINES, Wire—**

Braddock Machine & Mfg. Co., Braddock, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

BARB WIRE—See Wire, Barb.**BARB WIRE CARRIERS—See Carriers, Barb Wire.****BARN DOOR BOLTS—See Bolts, Barn Door.****BARREL CARTS—See Carts, Barrel.****BARREL COVERS, DRAINERS, ELEVATORS, &c.—See Covers, Drainers, Elevators, &c.****BARREL HOOP MACHINES—See Hoop Machines, Barrel.****BARRELS, Oil Well, &c., Seamless Steel—**

Wm. B. Sealie & Sons, Pittsburgh, Pa.
Shelby Steel Tube Co., Cleveland, O.

BARRELS, Tumbling—

Henderson Bros., Waterbury, Ct.
Hollands Mfg. Co., Erie, Pa.
Northern Engineering Works, Detroit, Mich.
S. Obermayer Co., Cincinnati, O.
J. W. Paxson Co., Philadelphia, Pa.
Royersford Foundry & Machine Co., Royersford, Pa.
Stover Mfg. Co., Freeport, Ill.
Whiting Foundry Equipment Co., Harvey, Ill.

BARROWS, Hand—

V. Clad & Sons, Philadelphia, Pa.
W. J. Clark Co., Salem, O.

BARROWS, TOY—See Toy Barrows.**BARROWS, Wheel—**

American Steel Scraper Co., Sydney, O.
Atlas Bolt & Screw Co., Cleveland, O.
Boston & Lockport Block Co., Boston.
Bryan Mfg. Co., Bryan, O.
Buffalo Scale Co., Buffalo, N. Y.
W. J. Clark Co., Salem, O.
Cleveland Facing Mill Co., Cleveland, O.
Fairbanks Co., 311 Broadway, New York.
Havana Metal Wheel Co., Havana, Ill.
C. W. Hunt Co., West New Brighton, N. Y.
Iowa Farming Tool Co., Fort Madison, Ia.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
J. W. Paxson Co., Philadelphia, Pa.
Wm. B. Pollock Co., Youngstown, O.
Syracuse Chilled Plow Co., Syracuse, N. Y.
West Side Foundry Co., Troy, N. Y.
Withington & Codley Mfg. Co., Jackson, Mich.

BARROW WHEELS—See Wheels, Barrow.**BARS, Aluminum—**

Pittsburgh Reduction Co., Pittsburgh, Pa.

BARS, Bicycle Handle—

Ames Sword Co., Chicopee, Mass.

BARS AND SEGMENTS, Commutator—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Billings & Spencer Co., Hartford, Ct.
Keystone Drop Forge Co., Philadelphia.
Van Wagoner & Williams Hdw. Co., Cleveland, O.

BARS, Copper—See Copper.**BARS, Eye—**

Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.
A. & P. Roberts Co., Philadelphia, Pa.

BARS, Ice—

L. & I. J. White Co., Buffalo, N. Y.
Wm. T. Wood & Co., Arlington, Mass.

BARS, Iron—

American Iron & Steel Mfg. Co., Lebanon, Pa.
American Steel Hoop Co., Pittsburgh, Pa.
C. R. Baird & Co., Philadelphia, Pa.
Brown & Co., Inc., Pittsburgh, Pa.
Burden Iron Co., Troy, N. Y.
Champion Iron & Steel Co., Muskegon, Mich.
Consolidated Iron & Steel Co., Bristol, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Chas. E. McInnes & Co., Philadelphia, Pa.
Milton Mfg. Co., Milton, Pa.
Monongahela Iron & Steel Co., Pittsburgh, Pa.
National Steel Co., Battery Park Building, New York.
John B. Newkirk & Co., Philadelphia, Pa.
B. Nicoll & Co., 66 Wall St., New York.
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Horace T. Potts & Co., Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.
E. H. Stroud & Co., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
W. H. Thompson & Co., Philadelphia, Pa.
Virginia Iron, Coal & Coke Co., Bristol, Va.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
F. W. Wurster & Co., Brooklyn, N. Y.

BARS, Locomotive Cylinder Boring—See Boring Bars, Locomotive Cylinder.**BARS, Muck—**

American Steel Hoop Co., Pittsburgh, Pa.
Bethlehem Steel Co., S. Bethlehem, Pa.
Jerome Keeley & Co., Philadelphia, Pa.
J. Tatnall Lea & Co., Philadelphia, Pa.
J. J. Mohr, Philadelphia, Pa.
Nicolls, Wheeler & Co., Philadelphia, Pa.
J. Wesley Pullman, Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Frank Samuel, Philadelphia, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
E. H. Wilson & Co., Philadelphia, Pa.

BARS, Sheet—

Illinois Steel Co., Chicago, Ill.
National Steel Co., Battery Park Building, New York.
W. P. Snyder & Co., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

BARS, Shutter—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Hobart B. Ives & Co., New Haven, Ct.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Works, New Britain, Ct.

BARS, Steel—

American Iron & Steel Mfg. Co., Lebanon, Pa.
American Steel Hoop Co., Pittsburgh, Pa.
Braeburn Steel Co., Braeburn, Pa.
Cabeen & Co., Philadelphia, Pa.
Champion Iron & Steel Co., Muskegon, Mich.
Justice Cox, Jr., Philadelphia, Pa.
Denman & Davis, 5 Cliff St., New York.
J. W. Hoffman & Co., Philadelphia, Pa.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlins, Limited, Pittsburgh.

Kidd Bros. & Burgher Steel Wire Co., McKees Rocks, Pa.

Lockhart Iron & Steel Co., Pittsburgh, Pa.
Chas. E. McInnes & Co., Philadelphia, Pa.
National Steel Co., Battery Park Building, New York.

John B. Newkirk & Co., Philadelphia, Pa.
B. Nicoll & Co., 66 Wall St., New York.
Ogden & Wallace, 577 Greenwich St., N. Y.
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Horace T. Potts & Co., Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.
A. & P. Roberts Co., Philadelphia, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.
E. H. Stroud & Co., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
W. H. Thompson & Co., Philadelphia, Pa.
W. H. Wallace & Co., 66 Broadway, N. Y.

BARS, Tin Plate—

Illinois Steel Co., Chicago, Ill.
National Steel Co., Battery Park Building, New York.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

BASE KNOBS—See Knobs, Base.**BASES, Garment Stand—**

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

BASIN AND BATH SUPPLIES—

Randolph-Clowes Co., Waterbury, Ct.

BASIN PLUGS—See Plumbing Supplies.**BASINS, Catch—**

Wm. Bayley & Sons Co., Milwaukee, Wis.

BASKET HANDLES, Wire—See Handles, Basket, Wire.**BASKETS, Bread or Cake, Silver Plated—**

International Silver Co., 9-13 Maiden Lane, New York.

BASKETS, Card—

Fred. J. Meyers Mfg. Co., Hamilton, O.

BASKETS, Fish—

E. T. Barnum, Detroit, Mich.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Schaefer's Sons, Buffalo, N. Y.

BASKETS, Hanging—

Fred. J. Meyers Mfg. Co., Hamilton, O.

BASKETS, Sponge, &c.—

Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Schaefer's Sons, Buffalo, N. Y.

BASKETS, Waste—

Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Schaefer's Sons, Buffalo, N. Y.

BASKET TRUCKS—See Trucks, Basket.**BATHROOM AND TOILET SPECIALTIES—**

Crescent Brass & Iron Co., Detroit, Mich.
Taplin Mfg. Co., Forestville, Ct.

BATHTUBS—

Humphreys Mfg. Co., Mansfield, O.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

BATHTUB SEATS—See Seats, Bathtub.**BATTERIES, Electric—**

King Powder Co., Cincinnati, O.
W. R. Ostrander & Co., 22 Dey St., N. Y.

BATTERY CUPS—See Cups, Battery.**BATTERY PLATES, Rolled Zinc—**

Matthiessen & Hegeler Zinc Co., La Salle, Ill.
E. Phillips & Son, So. Hanover, Mass.

BATTERY ZINCS—See Zincs for Leclanche Batteries.**BEADERS, Hand—**

Stanley Rule & Level Co., New Britain, Ct.

BEADS, Corner—

Youngstown Iron & Steel Roofing Co., Youngstown, O.

BEAM HOOKS, SHEARS—See Hooks, Shears.**BEAMS AND CHANNELS—**

American Steel & Wire Co., Chicago, Ill.
 Illinois Steel Co., Chicago, Ill.
 Jones & Laughlins, Limited, Pittsburgh.
 W. W. Lindsay & Co., Philadelphia, Pa.
 Passaic Rolling Mill Co., Paterson, N. J.
 Phoenix Iron Co., Philadelphia, Pa.
 Pierson & Co., 29 Broadway, New York.
 A. & P. Roberts Co., Philadelphia, Pa.
 Wm. H. Wallace & Co., 66 Broadway, N. Y.

BEAMS, SCALE—See Scale Beams.**BEARING METAL—**

Magnolia Metal Co., 266 & 267 West St., New York.
 I. Shonberg, 172 Hudson St., New York.

BEARINGS, Ball—

Ball Bearing Co., Boston, Mass.
 Dodge Machine Screw Co., Boston, Mass.

BEARINGS, Lead Lined—

Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
 Paul S. Reeves & Son, Philadelphia, Pa.

BEARINGS, Oilless Shaft—

North American Metaline Co., Long Island City, N. Y.

BEARINGS, Roller—

Ball Bearing Co., Boston, Mass.
 Mossberg & Granville Mfg. Co., Providence, R. I.

BEARINGS, Self-Oiling—

Boston & Lockport Block Co., Boston, Mass.
 Fairmount Machine Co., Philadelphia, Pa.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.

BEATERS, Egg—

Edward Darby & Sons, Philadelphia, Pa.
 Nelson Lyon, Albany, N. Y.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Standard Company, Boston, Mass.
 Taplin Mfg. Co., Forestville, Ct.
 Wire Goods Co., Worcester, Mass.

BED CASTERS, FASTENERS, KEYS, LINKS, SCREWS—See Casters, Fasteners, Keys, Links, Screws.**BEDS, Mortar—**

Portland Ladder Co., Newark, N. J.

BEDSTEAD FASTENER SETTING MACHINES—See Machines to Set Bedstead Fasteners.**BEDSTEADS, Brass and Iron—**

Ansonia Brass & Copper Co., 19 Cliff St., New York.
 E. T. Barnum, Detroit, Mich.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Edward Darby & Sons, Philadelphia, Pa.
 Fred. J. Meyers Mfg. Co., Hamilton, O.

BEEF SCOOPS—See Scoops, Fork, Vegetable.**BELAYING PINS—See Pins, Belaying.****BELL CENTERING TOOLS—See Tools, Bell Centering.****BELL CORD COUPLINGS—See Couplings, Bell Cord.****BELL CRANKS, LEVERS, &c.—See Cranks, Levers, &c.****BELL HANGERS' BITS—See Bits, Bell Hangers'.****BELLOWS, Blacksmiths', Molders', &c.—**

Cleveland Facing Mill Co., Cleveland, O.
 S. Obermayer Co., Cincinnati, O.
 Osborn Mfg. Co., Cleveland, O.
 J. W. Paxson Co., Philadelphia, Pa.
 Geo. M. Scott, Chicago, Ill.

BELLOWS, Piano—

R. Bliss Mfg. Co., Pawtucket, R. I.

BELLS, Alarm—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Reading Hardware Co., Reading, Pa.

BELLS, Altar and Lodge—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Automobile—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Bicycle—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 Bridgeport Brass Co., Bridgeport, Ct.
 Bridgeport Gun Implement Co., 313 Broadway, New York.
 John H. Graham & Co., 113 Chambers St., New York.
 N. N. Hill Brass Co., East Hampton, Ct.
 Frank Mossberg Co., Attleboro, Mass.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Scovill Mfg. Co., Waterbury, Ct.
 Starr Bros. Bell Co., East Hampton, Ct.

BELLS, Car—

Bevin Bros. Mfg. Co., Hampton, Ct.
 John H. Graham & Co., 113 Chambers St., New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Starr Bros. Bell Co., East Hampton, Ct.

BELLS, Cow and Sheep—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 Starr Bros. Bell Co., East Hampton, Ct.

BELLS, Door—

Arcade Mfg. Co., Freeport, Ill.
 Bevin Bros. Mfg. Co., East Hampton, Ct.
 John H. Graham & Co., 113 Chambers St., New York.
 Norwalk Lock Co., South Norwalk, Ct.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BELLS, Dumb—

John C. Kupferle, St. Louis, Mo.
 Logan & Stobridge Iron Co., New Brighton, Pa.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 John Sommer's Son, Newark, N. J.
 Sam'l C. Tatum Co., Cincinnati, O.
 A. C. Williams, Ravenna, O.
 Wrightsville Hardware Co., Wrightsville, Pa.

BELLS, Electric—

W. R. Ostrander & Co., 22 Dey St., N. Y.

BELLS, Engine—

Bevin Bros. Mfg. Co., Hampton, Ct.
 Paul S. Reeves & Son, Philadelphia, Pa.
 Starr Bros. Bell Co., East Hampton, Ct.

BELLS, Farm, Church and School, &c.—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Fog—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Gong—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 Geo. Johnson, Catsanauqua, Pa.
 W. R. Ostrander & Co., 22 Dey St., N. Y.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Phosphor-Bronze Smelting Co., Philadelphia, Pa.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Starr Bros. Bell Co., East Hampton, Ct.

BELLS, Hand—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 N. N. Hill Brass Co., East Hampton, Ct.

BELLS, Hand and Electric, Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.

BELLS, House (on Carriage)—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 W. R. Ostrander & Co., 22 Dey St., N. Y.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BELLS, Lever—

W. R. Ostrander & Co., 22 Dey St., N. Y.

BELLS, Milkman's—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Pneumatic Call—

W. R. Ostrander & Co., 22 Dey St., N. Y.

BELLS, Ship—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 Edson Mfg. Co., Boston, Mass.

BELLS, Signal—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Sleigh—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 N. N. Hill Brass Co., East Hampton, Ct.
 Starr Bros. Bell Co., East Hampton, Ct.

BELLS, Tea and Call—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 John H. Graham & Co., 113 Chambers St., New York.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Starr Bros. Bell Co., East Hampton, Ct.
 Taplin Mfg. Co., Forestville, Ct.

BELLS, Team—

Bevin Bros. Mfg. Co., East Hampton, Ct.

BELLS, Telephone and Clock—

Bevin Bros. Mfg. Co., East Hampton, Ct.
 Bridgeport Brass Co., Bridgeport, Ct.
 N. N. Hill Brass Co., East Hampton, Ct.
 W. C. Ladd, Bristol, Ct.
 Plume & Atwood Mfg. Co., Waterbury, Ct.

BELLS, Tire—

John H. Graham & Co., 113 Chambers St., New York.

BELLS, TOY—See Toy Bells.**BELT AWLS, COUPLINGS, &c.—See Awls, Couplings, &c.****BELT CUTTERS—See Cutters, Belt.****BELT DRESSING—**

Alexander Bros., Philadelphia, Pa.
 Jos. Dixon Crucible Co., Jersey City, N. J.
 Ironsides Co., Columbus, O.
 Shultz Belting Co., St. Louis, Mo.

BELT FILLER—See Filler, Belt.**BELTING, Canvas—**

Main Belting Co., Philadelphia, Pa.
 T. B. Woods' Sons, Chambersburg, Pa.

BELTING CEMENT—See Cement, Belting.**BELTING, Chain—**

Buhl Malleable Co., Detroit, Mich.
 Heyl & Patterson, Pittsburgh, Pa.
 Jeffrey Mfg. Co., Columbus, O.
 Stanley Works, New Britain, Ct.

BELTING, Emery—

Boston Belting Co., Boston, Mass.

BELTING, Leather—

Alexander Bros., Philadelphia, Pa.
 Aultman Co., Canton, O.
 Boston Belting Co., Boston, Mass.
 Schultz Belting Co., St. Louis, Mo.
 Frank Toomey, Philadelphia, Pa.
 T. B. Woods' Sons, Chambersburg, Pa.

BELTING, Link—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Buhl Malleable Co., Detroit, Mich.
 Dodge Mfg. Co., Mishawaka, Ind.
 Filler & Stowell Co., Milwaukee, Wis.
 Heyl & Patterson, Pittsburgh, Pa.
 Jeffrey Mfg. Co., Columbus, O.
 Link-Belt Engineering Co., Philadelphia.

BELTING, Rawhide—

Shultz Belting Co., St. Louis, Mo.

BELTING, Rubber—

Aultman Co., Columbus, O.
 Boston Belting Co., Boston, Mass.
 Peerless Rubber Mfg. Co., 16 Warren St., New York.
 T. B. Woods' Sons, Chambersburg, Pa.

BELTING, Woven Duck—

Ames Sword Co., Chicopee, Mass.
 Main Belting Co., Philadelphia, Pa.

BELT LACING, Leather—

Boston Belting Co., Boston, Mass.
 Shultz Belting Co., St. Louis, Mo.

BELT LACING, Rawhide—

Shultz Belting Co., St. Louis, Mo.

BELT LACING, Steel—See Hooks, Belt.

BELTS, POLISHING—See Buffing and Polishing Machines.

BELT SHIFTERS—

Chandler & Farquhar, Boston, Mass.
Geo. V. Cresson Co., Philadelphia, Pa.
Mason Regulator Co., Boston, Mass.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

BELT TIGHTENERS—

Edw. P. Allis Co., Milwaukee, Wis.
Billings & Spencer Co., Hartford, Ct.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.
Filler & Stowell Co., Milwaukee, Wis.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
T. B. Woods' Sons, Chambersburg, Pa.

BELT TOOLS, Combination—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

BENCH, Circular Saw—

Baker Bros., Toledo, O.
Kimball Bros. & Sprague, Boston, Mass.

BENCHES, Carpenters' Work—

American Tool Chest Co., 200 West Houston St., New York.

BENCHES, DRAW—See Draw Benches.

BENCHES, HYDRAULIC DRAW—See Draw Benches, Hydraulic.

BENCHES, Sewing—

R. Bliss Mfg. Co., Pawtucket, R. I.
Watson-Stillman Co., 204-210 East 43d St., New York.

BENCHES, Wash—

J. R. Clark Co., Minneapolis, Minn.

BENCHES, Work—

Brown & Sharpe Mfg. Co., Providence, R. I.

BENCH LATHES, STOPS, &c.—See Lathes, Stops, &c.

BENCH LEG CASTINGS—See Castings, Bench Leg.

BENDERS, 'BICYCLE SPOKE—See Spoke Headers and Benders, Bicycle.

BENDERS, Pipe, Wire—

Cleveland Wire Spring Co., Cleveland, O.

BENDERS, Rail—

Bement, Miles & Co., Philadelphia, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
P. Hollingsworth Morris, Philadelphia, Pa.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Watson-Stillman Co., 204-210 East 43d St., New York.

BENDERS, Tire—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
Concord Axle Co., Penacook, N. H.
Fulton Iron & Engine Works, Detroit, Mich.
Fleuger & Henger Mfg. Co., St. Louis, Mo.
Wiley & Russell Mfg. Co., Greenfield, Mass.

BENDING IRONS—See Irons, Bending.

BENDING MACHINES—See Forming and Bending Machines—

Rudolph & Krummel, Chicago, Ill.

BENDING MACHINES for Handle Bars and Bicycle Frames.

BENDING MACHINES, Hydraulic—

Bement, Miles & Co., Philadelphia, Pa.
Wickes Bros., Saginaw, Mich.

BENDING MACHINES, Hydraulic Rail—

Bement, Miles & Co., Philadelphia, Pa.

BENDING MACHINES, Tube—

Watson-Stillman Co., 204-210 East 43d St., New York.

BENDING MACHINES, Wood—

Defiance Machine Works, Defiance, O.

BENDS, Wrought Iron, for Steam Plants—

Harrisburg Pipe Bending Co., Ltd., Harrisburg, Pa.
National Pipe Bending Co., New Haven, Ct.

BENT RIFFLERS—See Riffers, Bent.

BERRY BOWLS—See Bowls, Silver Plated.

BERRY DISHES—See Dishes, Silver Plated.

BERRY WASHERS—See Kitchen Articles, Wire.

BESSEMER COPPERED RODS—See Rods, Bessemer Coppered.

BEVELING SHEARS—See Shears, Beveling.

BEVELS—

Athol Machine Co., Athol, Mass.
Henry Disston & Sons, Philadelphia, Pa.
Sawyer Tool Co., Fitchburg, Mass.
Stanley Rule & Level Co., New Britain, Ct.
L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

BICYCLE BELLS, FORGINGS, &c.—See Bells, Forgings, &c.

BICYCLE CHAIN BARS—

Finished Steel Co., Youngstown, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.

BICYCLE CHAINS—See Chains, Bicycle.

BICYCLE CHAIN, Shapes for—

Finished Steel Co., Youngstown, O.

BICYCLE COASTER BRAKES—See Brakes, Coaster, Bicycle.

BICYCLE GUARD LACING—

Ossawan Mills Co., Norwich, Ct.

BICYCLE LAMPS, Electric—See Lamps, Electric Bicycle.

BICYCLE MACHINERY—

American Tool Works Co., Cincinnati, O.
Baker Bros., Toledo, O.
Bickford Drill & Tool Co., Cincinnati, O.
Billings & Spencer Co., Hartford, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
W. P. Davis Machine Co., Rochester, N. Y.
Diamond Machine Co., Providence, R. I.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring and Varick Sts., New York.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Huschart Machinery Co., Chicago, Ill.
J. J. McCabe, 14 Dey St., New York.
New Haven Mfg. Co., New Haven, Ct.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.
A. B. Pitkin Machinery Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Rudolph & Krummel Machine Works, Chicago, Ill.
Spencer Automatic Machine Screw Co., Hartford, Ct.
Windsor Machine Co., Windsor, Vt.

BICYCLE NIPPLE SPOKE GRIPS—See Grips, Nipple Spoke.

BICYCLE PARTS—

Ames Sword Co., Chicopee, Mass.
Avery Stamping Co., Cleveland, O.
Belden Machine Co., New Haven, Ct.
Billings & Spencer Co., Hartford, Ct.
Bridgeport Gun Implement Co., 313 Broadway, New York.
Davis & Buxton Stamping Co., Worcester, Mass.
Houghton & Buxton Mfg. Co., Worcester, Mass.
Indianapolis Drop Forging Co., Indianapolis, Ind.
Keystone Drop Forge Co., Philadelphia.
New Britain Hdw. Mfg. Co., New Britain, Ct.
Norwood Bicycle Co., Cincinnati, O.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Spencer Automatic Machine Screw Co., Hartford, Ct.
Springfield Machine Screw Co., Springfield, Mass.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

BICYCLES AND SUNDRIES—

Consolidated Railway Electric Lighting & Equipment Co., Derby, Ct.
Eclipse Bicycle Co., Elmira, N. Y.
Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
Fred. J. Meyers Mfg. Co., Hamilton, O.
National Sewing Machine Co., Belvidere, Ill.
Norwood Bicycle Co., Cincinnati, O.
Remington Arms Co., 313 Broadway, N. Y.
R. H. Wolff & Co., Foot 116th St., N. Y.

BICYCLE TIRE FLUID—See Tire Fluid, Bicycle.

BICYCLE TIRES—See Tires, Bicycle.

BICYCLE VALVE PULLERS—See Pullers, Valve.

BILL BINDERS—See Binders, Bill, Letter, &c.

BILLETS, Nickel Steel—

Heckert-Baltzley Billet Co., Toledo, O.

BILLETS, Open Hearth—

Bethlehem Steel Co., S. Bethlehem, Pa.
Champion Iron & Steel Co., Muskegon, Mich.
Cabeen & Co., Philadelphia, Pa.
Heckert-Baltzley Billet Co., Toledo, O.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Chas. E. McInnes & Co., Philadelphia, Pa.
National Steel Co., Battery Park Building, New York.
B. Nicoll & Co., 66 Wall St., New York.
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.
J. Wesley Pullman, Philadelphia, Pa.
A. & P. Roberts Co., Philadelphia, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Tidewater Steel Co., Philadelphia, Pa.
Virginia Iron, Coal & Coke Co., Bristol, Va.

BILLETS, Steel—

American Steel & Wire Co., Chicago, Ill.
Ashland Steel Co., Ashland, Ky.
C. R. Baird & Co., Philadelphia, Pa.
Bethlehem Steel Co., S. Bethlehem, Pa.
Cabeen & Co., Philadelphia, Pa.
Justice Cox, Jr., & Co., Philadelphia, Pa.
Danville Bessemer Co., Danville, Pa.
J. H. Hillman & Son, Pittsburgh, Pa.
Illinois Steel Co., Chicago, Ill.
Jerome Keeley & Co., Philadelphia, Pa.
Jones & Laughlins, Limited, Pittsburgh, Pa.
J. Tatnall Lea & Co., Philadelphia, Pa.
Lorain Steel Co., Lorain, O.
A. Milne & Co., 1 Broadway, New York.
National Steel Co., Battery Park Building, New York.
B. Nicoll & Co., 66 Wall St., New York.
Pilling & Crane, Philadelphia, Pa.
Frank Samuel, Philadelphia, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.
E. H. Wilson & Co., Philadelphia, Pa.

BILL FILES—See Files, Bill, &c.

BILLIARD TABLE BOLTS AND CUSHIONS—See Bolts and Cushions.

BINDER, Log—

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

BINDERS AND HARVESTERS—See Harvesters and Binders.

BINDERS AND HOLDERS, Order Sheet, &c.—

Sam'l C. Tatum Co., Cincinnati, O.

BINDERS, Bill, Letter, &c.—

Globe-Wernicke Co., Cincinnati, O.

BINDER TWIN—See Twine, Binder.

BINDING CHAIN—See Chain.

BINDING-POSTS, Electrical—

Bowen Mfg. Co., Auburn, N. Y.
Dodge Machine Screw Co., Boston, Mass.

BINS, Nail—

W. J. Clark Co., Salem, O.
J. D. Warren Mfg. Co., Chicago, Ill.

BIRD CAGE HOOKS, SPRINGS—See Hooks, Springs.

BIRD CAGES—See Cages, Bird and Animal.

BIT AND SQUARE LEVELS—See Levels, Bit and Square.

BIT BRACES, GAUGES, &c.—See
Braces, Gauges, &c.**BITS, Bell Hangers'—**

Cleveland Twist Drill Co., Cleveland, O.
H. H. Mayhew Co., Shelburne Falls, Mass.
Norton Mfg. Co., Chester, Ct.
Snell Mfg. Co., Fiskdale, Mass.

BITS, Bridle—

American Steel & Wire Co., Chicago, Ill.
Imperial Bit & Snap Co., Racine, Wis.
John C. Schmidt & Co., York, Pa.

BITS, Countersink—

Snell Mfg. Co., Fiskdale, Mass.

BITS, Expansive—

R. H. Brown Co., New Haven, Ct.
Connecticut Valley Mfg. Co., Center Brook, Ct.
C. E. Jennings Co., 101 Reade St., N. Y.
Tower & Lyon, 95 Chambers St., New York.

BITS, Pod—

H. H. Mayhew Co., Shelburne Falls, Mass.
Snell Mfg. Co., Fiskdale, Mass.

BITS, Screw Driver—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Charles Buck, Milbury, Mass.
Connecticut Valley Mfg. Co., Center Brook, Ct.
Goodell-Pratt Co., Greenfield, Mass.
Keystone Drop Forge Co., Philadelphia.
H. H. Mayhew Co., Shelburne Falls, Mass.
Millers Falls Co., 28 Warren St., New York.
Norton Mfg. Co., Chester, Ct.
F. H. Perry & Co., Chester, Ct.
Snell Mfg. Co., Fiskdale, Mass.
Standard Tool Co., Cleveland, O.
Tuck Mfg. Co., Brockton, Mass.

BIT STOCK, Angle Boring—

John S. Fray & Co., Bridgeport, Ct.
Millers Falls Co., 28 Warren St., New York.

BLACKBOARDS, Children's—

Malne Mfg. Co., Nashua, N. H.

BLACKING BOX HOLDERS—See Hold-
ers, Blacking Box.**BLACKING, Shoe—**

Palmer Hdw. Mfg. Co., Troy, N. Y.

BLACK PLATE FOR TINNING—See
Plate, Black, for Tinning.**BLACKSMITHS' BELLOWS, BUFFERS,**
&c.—See Bellows, Buffers, &c.**BLACKSMITH TOOLS—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Goodell-Pratt Co., Greenfield, Mass.
Niles Tool Works Co., Hamilton, O.
Williams, White & Co., Moline, Ill.

BLADE Saw, Blanks—

Pierson & Co., 29 Broadway, New York.

BLADES, BUTCHER SAW—

Henry Disston & Sons, Philadelphia, Pa.
Goodell-Pratt Co., Greenfield, Mass.

BLADES, Metal Shear—

John Loyd, 358 Water St., New York.
F. R. Phillips' Sons Co., Philadelphia, Pa.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Samuel Trethewey & Co., Pittsburgh, Pa.
L. & I. J. White Co., Buffalo, N. Y.

BLADES, SAW, HACK, &c.—See Saws,
Hack, &c.**BLANKETS, Printers' Rubber—**

Boston Belting Co., Boston, Mass.

BLANKET STRAPS—See Straps, Blan-
ket.**BLANKING AND FORMING, Sheet**
Metal—See Stamping, Sheet Metal.**BLANKS, Gear—**

Frankfort Steel Co., Ellwood City, Pa.

BLANKS, Key, Stove—See Keys,
Stoves.**BLANKS, Snap Gauge—**

Billings & Spencer Co., Hartford, Ct.

BLANKS, Thumb Nut—

Billings & Spencer Co., Hartford, Ct.
J. H. Williams & Co., Brooklyn, N. Y.

BLANKS, Thumb Screw—

Keystone Drop Forge Co., Philadelphia.
J. H. Williams & Co., Brooklyn, N. Y.

BLAST FURNACE CASTING MACHINES
—See Casting Machines, Blast Fur-
nace.**BLAST FURNACE MACHINERY—**

Allentown Rolling Mills, Allentown, Pa.
Edw. P. Allis Co., Milwaukee, Wis.
Mesta Machine Co., Pittsburgh, Pa.
W. B. Pollock Co., Youngstown, O.

BLAST GATES—See Gates, Blast.**BLIND ADJUSTERS, FASTENERS,**
HINGES—See Adjusters, Fasteners,
Hinges.**BLOCKING, Adjustable—**

Wm. G. Le Count, South Norwalk, Ct.

BLOCKS, Blast Furnace—

M. D. Valentine & Bro. Co., Woodbridge, N. J.

BLOCKS, Bucket—

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

BLOCK SCRAPERS, BUTCHERS'—See
Scrapers, Butchers' Block.**BLOCKS, Deck and Snaath—**

Boston & Lockport Block Co., Boston.
Cleveland Block Co., Cleveland, O.
Charles G. Eckstein, 247 Centre St., N. Y.
A. Leschen & Sons Rope Co., St. Louis, Mo.
W. & J. Tiebout, 118 Chambers St., N. Y.

BLOCKS, Differential Pulley—

Boston & Lockport Block Co., Boston.
Chisholm & Moore Mfg. Co., Cleveland, O.

BLOCKS, Hoisting—

Boston & Lockport Block Co., Boston, Mass.
C. W. Hunt Co., West New Brighton, N. Y.

BLOCKS, Lead—

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

BLOCKS, Leveling—

Wiley & Russell Mfg. Co., Greenfield, Mass.

BLOCKS, Locomotive—

Ostrander Fire Brick Co., Troy, N. Y.

BLOCKS, Oil Derrick—

Boston & Lockport Block Co., Boston.

BLOCKS, Pillow—

Edw. P. Allis Co., Milwaukee, Wis.
Aultman Co., Canton, O.
Bates Machine Co., Joliet, Ill.
Braddock Machine & Mfg. Co., Braddock, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Filler & Stowell Co., Milwaukee, Wis.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Jones & Laughlins, Limited, Pittsburgh.
Wm. Sellers & Co. (Inc.), Philadelphia.
T. B. Woods' Sons, Chambersburg, Pa.

BLOCKS, Scribing—

Hoggson & Pettis Mfg. Co., New Haven, Ct.

BLOCKS, Steel—

A. Leschen & Sons Rope Co., St. Louis, Mo.

BLOCKS, Swage—

Pleuger & Henger Mfg. Co., St. Louis, Mo.
Wells Bros & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

BLOCKS, Tackle—

Boston & Lockport Block Co., Boston, Mass.
Cleveland Block Co., Cleveland, O.
Fulton Iron & Engine Works, Detroit, Mich.
Lane Bros. Co., Poughkeepsie, N. Y.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Rhode Island Tool Co., Providence, R. I.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
W. & J. Tiebout, 118 Chambers St., N. Y.
Trenton Iron Co., Trenton, N. J.
Union Hardware Co., Torrington, Ct.

BLOOMING MILLS—

Frank-Kneeland Mch. Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
William Tod & Co., Youngstown, O.
Totren & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.

BLOOMS, Charcoal—

Nicolls, Wheeler & Co., Philadelphia, Pa.

BLOWERS—

American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Exeter Machine Works, Exeter, N. H.
Fairbanks Co., 311 Broadway, New York.
New York Blower Co., 39 Cortlandt St., New York.
Niles Tool Works Co., Hamilton, O.
J. W. Paxson Co., Philadelphia, Pa.
Pennsylvania Machinery Co., Philadelphia, Pa.
B. F. Sturtevant Co., Boston, Mass.
Frank Toomey, Philadelphia, Pa.
Wilbraham-Baker Blower Co., Philadelphia.

BLOWERS, Electric—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
General Electric Co., Schenectady, N. Y.

BLOWERS, Pressure—

American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Boston Blower Co., Hyde Park, Mass.
Chicago Flexible Shaft Co., Chicago, Ill.
Exeter Machine Works, Exeter, N. H.
New York Blower Co., 39 Cortlandt St., New York.
Wilbraham-Baker Blower Co., Philadelphia.

BLOWER STANDS—See
Stands, Blower.**BLOW OFF TANKS—**

Harrison Safety Boiler Works, Philadelphia.
Wm. B. Pollock Co., Youngstown, O.

BOARD BILL CLIPS—See Clips, Bill
Letter, &c., Board.**BOARD RULES—See Rules, Board.****BOARDS, Bread—**

J. R. Clark Co., Minneapolis, Minn.
Hill Dryer Co., Worcester, Mass.
Anthony Wayne Mfg. Co., Fort Wayne, Ind.

BOARDS, Glass—

Lufkin Rule Co., Saginaw, Mich.
Lightning Novelty Co., Des Moines, Iowa.

BOARDS, Ironing—

J. R. Clark Co., Minneapolis, Minn.
Hill Dryer Co., Worcester, Mass.

BOARDS, Mortar—

Portland Ladder Co., Newark, N. J.

BOARDS, Shoveling—

Havana Metal Wheel Co., Havana, Ill.

BOARDS, Shuffle—

Narragansett Machine Co., Providence, R. I.

BOAT ANCHORS, HOOKS, &c.—See
Anchors, Hooks, &c.**BOATS, Sail—**

John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.

BOBBIN WINDING MACHINES—

Fairmount Machine Co., Philadelphia, Pa.

BOBS, Mercury Plumb—

Brown & Sharpe Mfg. Co., Providence, R. I.

BOBS, Plumb—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Henry Disston & Sons, Philadelphia, Pa.
John C. Kuperle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Rule & Level Co., New Britain, Ct.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
Tower & Lyon, 95 Chambers St., New York.
T. F. Welch Mfg. Co., Boston, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.

BOILER BRACE IRON—See Iron, Boiler Brace.**BOILER BRACES—**

Lukens Iron & Steel Co., Coatesville, Pa.

BOILER COMPOUNDS—See Compounds, Boiler.**BOILER DRILLS, FURNACES, &c.—See Drills, Furnaces, &c.****BOILER FRONTS—**

Wm. Bayley & Son Co., Milwaukee, Wis.

BOILER HANDLES—See Tanners' Trimmings.**BOILER MAKERS' TOOLS—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.

Hill, Clarke & Co., Boston, Mass.

Hill & Jones Co., Wilmington, Del.

Manning, Maxwell & Moore, 85 Liberty St., New York.

Marshall & Huschart Machinery Co., Chicago, Ill.

J. J. McCabe, 14 Dey St., New York.

New Doty Mfg. Co., Janesville, Wis.

New Haven Mfg. Co., New Haven, Ct.

Niles Tool Works Co., Hamilton, O.

Prentice Bros., Worcester, Mass.

Prentiss Tool & Supply Co., 44 Barclay St., New York.

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.
Wals & Roos Punch & Shear Co., Cincinnati, O.

Wickes Bros., Saginaw, Mich.

BOILERS, House, Copper—

V. Clad & Sons, Philadelphia, Pa.

Randolph-Clowes Co., Waterbury, Ct.

Wm. B. Scaife & Sons, Pittsburgh, Pa.

BOILERS, Portable—

Harrison Safety Boiler Works, Philadelphia, Pa.

James Leffel & Co., Springfield, O.

BOILERS, Steam—

Edward P. Allis Co., Milwaukee, Wis.

Babcock & Wilcox Co., 29 Cortlandt St., New York.

Brown Holsting & Conveying Mach. Co., Cleveland, O.

Cahall Sales Department, Pittsburgh, Pa.

Thos. Carlin's Sons, Allegheny, Pa.

Thomas P. Conrad, Philadelphia, Pa.

Edward J. Etting, Philadelphia, Pa.

Exeter Machine Works, Exeter, N. H.

Harrison Safety Boiler Works, Philadelphia, Pa.

Hyde Bros. & Co., Pittsburgh, Pa.

F. W. Iredell, 26 Cortlandt St., New York.

Lane & Bodley Co., Cincinnati, O.

Lee-Odium Boiler Co., Memphis, Tenn.

James Leffel & Co., Springfield, O.

Lidgerwood Mfg. Co., 96 Liberty St., N. Y.

Lovegrove & Co., Philadelphia, Pa.

F. McSwegan & Sons, 120 Liberty St., N. Y.

F. R. Patch Mfg. Co., Rutland, Vt.

Pennsylvania Machinery Co., Philadelphia, Pa.

Wm. B. Pollock Co., Youngstown, O.

Ritter-Conley Mfg. Co., Pittsburgh, Pa.

Wm. B. Scaife & Son, Pittsburgh, Pa.

Silver Mfg. Co., Salem, O.

Taunton Locomotive Mfg. Co., Taunton, Mass.

Frank Toomey, Philadelphia, Pa.

Warren City Boiler Works, Warren, O.

Egbert P. Watson, Elizabeth, N. J.

Robert Wetherill & Co., Chester, Pa.

W. W. Whitehead, Davenport, Iowa.

Wickes Bros., Saginaw, Mich.

S. M. York Co., Cleveland, O.

York Mfg. Co., York, Pa.

BOILERS, Wash—Keen & Hagerty Mfg. Co., Baltimore, Md.
Rome Mfg. Co., Rome, N. Y.**BOLSTER PLATES—See Plates, Bolster.****BOLT AND NUT MACHINERY—**

Acme Machinery Co., Cleveland, O.

Ajax Mfg. Co., Cleveland, O.

U. Baird Machinery Co., Pittsburgh, Pa.

Detrick & Harvey Machine Co., Baltimore, Md.

Dunham Nut Co., Unionville, Ct.

Hill, Clarke & Co., Boston, Mass.

Howard Iron Works, Buffalo, N. Y.

Manning, Maxwell & Moore, 85 Liberty St., New York.

Marshall & Huschart Machinery Co., Chicago, Ill.

National Machinery Co., Tiffin, O.

Prentiss Tool & Supply Co., 115 Liberty St., New York.

Reliance Machine & Tool Co., Cleveland, O.

Waterbury Farrel Foundry & Mch. Co., Waterbury, Ct.

Webster & Perks Tool Co., Springfield, O.

Wells Bros. & Co., Greenfield, Mass.

Wiley & Russell Mfg. Co., Greenfield, Mass.

Windsor Machine Co., Windsor, Ct.

BOLT, COPPER, CUTTERS, &c.—See Copper, Cutters, &c.**BOLT ENDS—**

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Pittsburgh Screw and Bolt Co., Pittsburgh.

Republic Iron & Steel Co., Chicago, Ill.

Wheeling Hinge Co., Wheeling, W. Va.

BOLT HEAD MILLING MACHINES—See Nut and Bolt Head Milling Machines.**BOLT HEAD TRIMMERS—See Trimmers, Bolt Head.****BOLT IRON—**

Brown & Co., Pittsburgh, Pa.

Republic Iron & Steel Co., Chicago, Ill.

BOLT KEGS—See Kegs, Nail, Bolt, Nut, &c.**BOLT POINTING MACHINES—**

Acme Machinery Co., Cleveland, O.

Detrick & Harvey Machine Co., Baltimore.

Niles Tool Works Co., Hamilton, O.

BOLTS, Agricultural—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Republic Iron & Steel Co., Chicago, Ill.

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BOLTS, Anchor—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.

Cleveland Facing Mill Co., Cleveland, O.

Wm. R. Scaife & Sons, Pittsburgh, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

BOLTS, Barn Door—

American Steel & Wire Co., Chicago, Ill.

Arcade Mfg. Co., Freeport, Ill.

Enterprise Mfg. Co., Philadelphia, Pa.

BOLTS, Billiard Table—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Shelton Co., Derby, Ct.

BOLTS, Blank—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Pittsburgh Screw & Bolt Co., Pittsburgh.

Port Chester Bolt & Nut Co., Port Chester, N. Y.

Republic Iron & Steel Co., Chicago, Ill.

BOLTS, Boiler Patch—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Pittsburgh Screw & Bolt Co., Pittsburgh.

Worcester Machine Screw Co., Worcester, Mass.

BOLTS, Boiler Stay—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Lockhart Iron & Steel Co., Pittsburgh, Pa.

Pierson & Co., 29 Broadway, New York.

Republic Iron & Steel Co., Chicago, Ill.

BOLTS, Brass and Bronze—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Phosphor-Bronze Smelting Co., Philadelphia, Pa.

Steward, Romaine Mfg. Co., Philadelphia.

W. & J. Tiebout, 118 Chambers St., N. Y.

BOLTS, Bridge and Roof—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Belmont Iron Works, Philadelphia, Pa.

Jones & Laughlins, Ltd., Pittsburgh, Pa.

Pierson & Co., 29 Broadway, New York.

Port Chester Bolt & Nut Co., Port Chester, N. Y.

Republic Iron & Steel Co., Chicago, Ill.

Rockford Bolt Works, Rockford, Ill.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

BOLTS, Carriage—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Milton Mfg. Co., Milton, Pa.

Franklin Moore Co., Winsted, Ct.

Peck, Stow & Wilcox Co., 27 Murray St., New York.

Republic Iron & Steel Co., Chicago, Ill.

Rockford Bolt Works, Rockford, Ill.

Shelton Co., Derby, Ct.

Wheeling Hinge Co., Wheeling, W. Va.

Wilson & Smith, Worcester, Mass.

BOLTS, Copper—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

BOLTS, Cupboard—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

Reading Hardware Co., Reading, Pa.

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BOLTS, Dash—

Franklin Moore Co., Winsted, Ct.

BOLTS, Door—

Arcade Mfg. Co., Freeport, Ill.

Doebler Mfg. Co., Middletown, Ct.

Griffin Mfg. Co., Allegheny, Pa.

Hobart B. Ives & Co., New Haven, Ct.

Logan & Strobridge Iron Co., New Brighton, Pa.

Ney Mfg. Co., Canton, O.

Norwalk Lock Co., South Norwalk, Ct.

Peck, Stow & Wilcox Co., 27 Murray St., New York.

Reading Hardware Co., Reading, Pa.

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

Stanley Works, New Britain, Ct.

Taylor & Boggis Foundry Co., Cleveland, O.

Van Wagoner & Williams Hardware Co., Cleveland, O.

A. C. Williams, Ravenna, O.

BOLTS, Elevator—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Avery Stamping Co., Cleveland, O.

W. J. Clark Co., Salem, O.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Heyl & Patterson, Pittsburgh, Pa.

Republic Iron & Steel Co., Chicago, Ill.

Rockford Bolt Works, Rockford, Ill.

BOLTS, Expansion, Single and Double—

Isaac Church, Toledo, O.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

McCabe Hanger Mfg. Co., 532-42 W. 22d St., New York.

Henry B. Newhall, 26 Cortlandt St., New York.

Daniel C. Seaman & Co., Philadelphia, Pa.

Steward & Romaine Mfg. Co., Philadelphia.

BOLTS, Eye—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Billings & Spencer Co., Hartford, Ct.

Bradlee & Co., Philadelphia, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Keystone Drop Forge Co., Philadelphia.

Republic Iron & Steel Co., Chicago, Ill.

Rhode Island Tool Co., Providence, R. I.

W. & J. Tiebout, 118 Chambers St., N. Y.

Transue & Williams Co., Alliance, O.

Wheeling Hinge Co., Wheeling, W. Va.

J. H. Williams & Co., Brooklyn, N. Y.

Wire Goods Co., Worcester, Mass.

BOLTS, Fancy (Cone, Steeple, Elliptic, Thread, Body Loop, &c.)—

Franklin Moore Co., Winsted, Ct.

Rhode Island Tool Co., Providence, R. I.

See also, *Bolts, Special.***BOLTS, Forged—**

American Iron & Steel Mfg. Co., Lebanon, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Rhode Island Tool Co., Providence, R. I.

BOLTS, Formation—

Pittsburgh Screw & Bolt Co., Pittsburgh.

BOLTS, Galvanized—

American Iron & Steel Mfg. Co., Lebanon, Pa.

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

Republic Iron & Steel Co., Chicago, Ill.

W. & J. Tiebout, 118 Chambers St., N. Y.

BOLTS, King—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Atwater Mfg. Co., Southampton, Ct.
E. D. Clapp Mfg. Co., Auburn, N. Y.
Republic Iron & Steel Co., Chicago, Ill.

BOLTS, Loom—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

BOLTS, Machine—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Sam'l Hall's Sons, 229-233 W. 10th St., New York.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
W. W. Lindsay & Co., Philadelphia, Pa.
Milton Mfg. Co., Milton, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Republic Iron & Steel Co., Chicago, Ill.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Works, Rockford, Ill.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Shelton Co., Derby, Ct.
Wilson & Smith, Worcester, Mass.
Worcester Machine Screw Co., Worcester, Mass.

BOLTS OR SPIKES, Drift—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Republic Iron & Steel Co., Chicago, Ill.

BOLTS, Patch—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Chicago Screw Co., Chicago, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
New Britain Hardware Mfg. Co., New Britain, Ct.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Rhode Island Tool Co., Providence, R. I.

BOLTS, Planer Head—

Chicago Screw Co., Chicago, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
New Britain Hardware Mfg. Co., New Britain, Ct.
Worcester Machine Screw Co., Worcester, Mass.

BOLTS, Plow—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.
Shelton Co., Derby, Ct.

BOLTS, Reach—

Franklin Moore Co., Winsted, Ct.

BOLTS, Ring—

W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.

BOLTS, Screen—

American Iron & Steel Mfg. Co., Lebanon, Pa.

BOLTS, Seat—

Franklin Moore Co., Winsted, Ct.

BOLTS, Shackle—

Port Chester Bolt & Nut Co., Port Chester, N. Y.

BOLTS, Shaft—

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BOLTS, Shutter—

Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Works, New Britain, Ct.
Wrightsville Hdw. Co., Wrightsville, Pa.

BOLTS, Sink—

American Screw Co., Providence, R. I.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Shelton Co., Derby, Ct.

BOLTS, Sleigh Shoe—

American Screw Co., Providence, R. I.
Franklin Moore Co., Winsted, Ct.
Republic Iron & Steel Co., Chicago, Ill.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Shelton Co., Derby, Ct.

BOLTS, Socket—

American Iron & Steel Mfg. Co., Lebanon, Pa.

BOLTS, Special (Coupling, Screen, Deckhanger, Joint, Button Head, Bung Head, Boiler, Headless, Slotted Head, Hook Head, Cube Head, &c.)—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Chicago Screw Co., Chicago, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
W. W. Lindsay & Co., Philadelphia, Pa.
Franklin Moore Co., Winsted Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Works, Rockford, Ill.
Wilson & Smith, Worcester, Mass.
Worcester Machine Screw Co., Worcester, Mass.

BOLTS, Stove—

American Screw Co., Providence, R. I.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Shelton Co., Derby, Ct.
Wheeling Hinge Co., Wheeling, W. Va.

BOLTS, Stud—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
W. W. Lindsay & Co., Philadelphia, Pa.
Milton Mfg. Co., Milton, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Rhode Island Tool Co., Providence, R. I.
Worcester Machine Screw Co., Worcester, Mass.

BOLTS, Tap—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Republic Iron & Steel Co., Chicago, Ill.
Rhode Island Tool Co., Providence, R. I.

BOLTS, Tire—

American Screw Co., Providence, R. I.
Franklin Moore Co., Winsted, Ct.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Providence, R. I.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Shelton Co., Derby, Ct.

BOLTS, Track—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Republic Iron & Steel Co., Chicago, Ill.
W. H. Thompson & Co., Beloit, Mich.

BOLTS, Water Closet Indicator—

Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BOLTS, Whiffletree—

Franklin Moore Co., Winsted, Ct.
Port Chester Bolt & Nut Co., Port Chester, N. Y.

BOLTS, Window Spring—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BOLTS, Window, Ventilating—

Hobart B. Ives & Co., New Haven, Ct.

BOLT, WIRE—See Wire Bolt.**BONDS, Rail—**

American Steel & Wire Co., Chicago, Ill.

BONE, Case Hardening—

J. W. Paxson Co., Philadelphia, Pa.

BONE MILLS—See Mills, Bone.**BOOK BINDERS' MACHINERY—**

Sigourney Tool Co., Hartford, Ct.

BOOK BINDER WIRE—See Wire, Bottling, Book Binder, &c.**BOOKCASE DOOR ROLLS—See Rolls, Bookcase, Door.****BOOK CASES—See Cases, Book.****BOOK, PAPER AND CARD RACKS—See Racks, Card, Book and Paper.****BOOKS—**

David Williams Co., 232 William St., N. Y.

BOOKS, Weight Ticket—

Standard Scale & Supply Co., Limited, Pittsburgh, Pa.

BOOM TRAVELERS—See Travelers, Boom and Deck.**BOOT CALKS, JACKS—See Calks, Jacks.****BOOTS, Elevator—**

Edw. P. Allis Co., Milwaukee, Wis.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Buhl Malleable Co., Detroit, Mich.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.

BOOTS, Interfering—

Covert Mfg. Co., W. Troy, N. Y.

BORERS, Bung Hole—

Enterprise Mfg. Co., Philadelphia, Pa.

BORERS, Counter—

Cleveland Twist Drill Co., Cleveland, O.

BORING AND FACING MACHINES, Duplex Pump—

Niles Tool Works Co., Hamilton, O.

BORING AND TURNING MILLS, Steel Tire—

Niles Tool Works Co., Hamilton, O.

BORING BARS, for Locomotive Cylinder—

Niles Tool Works Co., Hamilton, O.
Pedrick & Ayer Co., Philadelphia, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.

BORING MACHINES—

American Tool Works Co., Cincinnati, O.
U. Baird Machinery Co., Pittsburgh, Pa.
Baker Bros., Toledo, O.
Baush & Harris Machine Tool Co., Springfield, Mass.
Bement, Miles & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Bullard Machine Tool Co., Bridgeport, Ct.
Detrick & Harvey Machine Co., Baltimore.
Fox Machine Co., Grand Rapids, Mich.
E. Harrington Son & Co., Philadelphia, Pa.
Hill, Clarke & Co., Boston, Mass.
Lodge & Shipley Machine Tool Co., Cincinnati, O.
Lucas & Glem, Philadelphia, Pa.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Huschart Machinery Co., Chicago, Ill.
New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works Co., Hamilton, O.
Pawling & Harnischfeger, Milwaukee, Wis.
Pedrick & Ayer Co., Philadelphia, Pa.
A. B. Pitkin Machinery Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.
Prentice Bros., Worcester, Mass.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Frank Toomey, Philadelphia, Pa.

BORING MACHINES, Car Box—

Bement, Miles & Co., Philadelphia, Pa.
Detrick & Harvey Mch. Co., Baltimore, Md.
Niles Tool Works Co., Hamilton, O.

BORING MACHINES, Carpenters—

American Tool Works Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.
Millers Falls Co., 28 Warren St., New York.
Snell Mfg. Co., Fiskdale, Mass.

BORING MACHINES, Car Wheel—

Bement, Miles & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Niles Tool Works Co., Hamilton, O.
Prentice Bros., Worcester, Mass.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

BORING MACHINES, Cylinder—

Baker Bros., Toledo, O.
Bement, Miles & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Hill, Clarke & Co., Boston, Mass.
Lodge & Shipley Machine Tool Co., Cincinnati, O.
Lucas & Gillem, Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Pedrick & Ayer Co., Philadelphia, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

BORING MACHINES, HUB—See Hub Boring Machines.**BORING MACHINES, Man Hole—**

Bement, Miles & Co., Philadelphia, Pa.

BORING MACHINES, Sash and Blind—

Stow Flexible Shaft Co., Philadelphia, Pa.

BORING MILLS—See Mills, Boring and Turning.**BOTANIZING DRUMS—See Drums, Botanizing.****BOTTLE HOLDERS, CHAMPAGNE—See Holders, Bottle, Silver Plated—****BOTTLES, Steel—**

Avery Stamping Co., Cleveland, O.
C. G. Eckstein & Co., 249 Centre St., N. Y.
Janney, Steinmetz & Co., Philadelphia, Pa.
National Tube Co., Pittsburgh, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

BOTTLING FAUCETS, MOLDS—See Faucets, Molds.**BOTTLING WIRE—See Wire, Bottling, Book Binder, &c.****BOTTOMS, Copper—**

Ansonia Brass & Copper Co., 19 Cliff St., New York
Randolph-Clowes Co., Waterbury, Ct.

BOWLING ALLEYS—See Alleys, Bowling.**BOWLS, Berry, Fruit, Ice, Sugar, &c., Silver Plated—**

International Silver Co., 9-13 Maiden Lane, New York.

BOWLS, Forged Separator—

Avery Stamping Co., Cleveland, O.

BOX, CHISELS, &c.—See Chisels, &c.**BOXES, Annealing—**

Warren City Boiler Works, Warren, O.

BOXES, Butter—

J. R. Clark Co., Minneapolis, Minn.

BOXES, Cast Iron Waste—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
George Gorton Machine Co., Racine, Wis.

BOXES, Cigar, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.

BOXES, Coal—

W. J. Clark Co., Salem, O.

BOXES, Document—

Globe-Wernicke Co., Cincinnati, O.

BOXES, Folding Paper—

Folding Paper Box Co., South Bend, Ind.

BOXES, Glove, Match, Powder, Soap, Stamp, &c., Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

BOXES, Letter—

Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.

BOXES, Mail—

Forest City Foundry & Mfg. Co., Cleveland.
W. C. Heller & Co., Montclair, N. J.
Norwalk Lock Co., South Norwalk, Ct.
Sam'l C. Tatum Co., Cincinnati, O.
Taylor & Boggis Foundry Co., Cleveland.

BOXES, Match, Aluminum—

Scovill Mfg. Co., Waterbury, Ct.

BOXES, Miter—

C. E. Jennings Co., 101 Reade St., N. Y.
Millers Falls Co., 28 Warren St., New York.
Stanley Rule & Level Co., New Britain, Ct.
Thomson Bros. & Co., Lowell, Mass.

BOXES, Paper—

Folding Paper Box Co., South Bend, Ind.
Jesse Jones Paper Box Co., Philadelphia.

BOXES, Pin—See Pin Trays and Boxes.**BOXES, Rolling—**

W. J. Clark Co., Salem, O.

BOXES, Shelf—

W. J. Clark Co., Salem, O.
A. H. Green, 22 Park Place, New York.
W. C. Heller & Co., Montclair, N. J.
Jesse Jones Paper Box Co., Philadelphia.
C. P. Moore, Ravenswood, W. Va.

BOXES, Shoe Blacking—

Star Heel Plate Co., Newark, N. J.

BOXES, Small Wood Packing—

A. H. Green, 22 Park Place, New York.
A. J. Phillips Co., Fenton, Mich.

BOXES, Soap, Silver Plated—

S. F. Myers Co., 48-50 Maiden Lane, N. Y.

BOXES, Steel Storage—

W. J. Clark Co., Salem, O.

BOXES, THIMBLE SKEIN—See Skeins, Thimble, and Boxes.**BOXES, Tin—**

Keen & Hagerly Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

BOXES, Tobacco, Aluminum—

Scovill Mfg. Co., Waterbury, Ct.

BOXES, Tool—

W. J. Clark Co., Salem, O.

BOXES, Tote—

Avery Stamping Co., Cleveland, O.
W. J. Clark Co., Salem, O.
Kilbourne & Jacobs Mfg. Co., Columbus, O.

BOXES, Twine—

John Chatillon & Sons, 85-93 Cliff St., N. Y.
Mason & Parker, Winchendon, Mass.
Nicol & Co., Chicago, Ill.

Peck, Stow & Wilcox Co., 27 Murray St., New York.

Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

Sam'l C. Tatum Co., Cincinnati, O.

A. C. Williams, Ravenna, O.

BOX FACTORY MACHINERY—

Egan Co., Cincinnati, O.
Wickes Bros., Saginaw, Mich.

BOX ROD NUTS AND WASHERS—See Nuts and Washers.**BOX SEALS—See Seals, Box and Case.****BOXWOOD RULES—See Rules, Boxwood.****BRACES AND RAILS, Top—**

E. D. Clapp Mfg. Co., Auburn, N. Y.

BRACES, Bit—

Bridgeport Mfg. Co., Bridgeport, Ct.
John S. Fray & Co., Bridgeport, Ct.
Goodell-Pratt Co., Greenfield, Mass.
C. E. Jennings Co., 101 Reade St., N. Y.
Mason & Parker, Winchendon, Mass.
H. H. Mayhew Co., Shelburne Falls, Mass.
Millers Falls Co., 28 Warren St., New York.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

BRACES, Extension—

John S. Fray & Co., Bridgeport, Ct.
Millers Falls Co., 28 Warren St., New York.

BRACES, Line, Telephone, Street, Railroad and Electric Pole—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Rockford Bolt Works, Rockford, Ill.

BRACES, Music Rack—

Sabin Machine Co., Montpelier, Vt.

BRACES, Rudder—

W. & J. Tiebout, 118 Chambers St., N. Y.

BRACES, Skate Ankle—

Samuel Winslow Skate Mfg. Co., Worcester, Mass.

BRACKETS AND FIXTURES, Shade Roller—

Stover Mfg. Co., Freeport, Ill.

BRACKETS, Axe—

W. & J. Tiebout, 118 Chambers St., N. Y.

BRACKETS, Flower Pot—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.

BRACKETS, Hand Rail—

Arcade Mfg. Co., Freeport, Ill.
Norwalk Lock Co., South Norwalk, Ct.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

BRACKETS, Lamp—

Arcade Mfg. Co., Freeport, Ill.
Bevin Bros. Mfg. Co., E. Hampton, Ct.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Edward Miller & Co., Meriden, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.

BRACKETS, Office, Counter, &c.—See Railing and Brackets, Office, Counter, &c.**BRACKETS, &c., Plumbing—**

Barnes Mfg. Co., Mansfield, O.
Crescent Brass & Iron Co., Detroit, Mich.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Stover Mfg. Co., Freeport, Ill.
Wrightsville Hardware Co., Wrightsville, Pa.

BRACKETS, Rafter—

Louden Machinery Co., Fairfield, Ia.
Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.
F. E. Myers & Bro., Ashland, O.
Ney Mfg. Co., Canton, O.
Red Jacket Mfg. Co., Davenport, Ia.

BRACKETS, Roofing—

Berger Bros., Philadelphia, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Rule & Level Co., New Britain, Ct.

BRACKETS, Shelf—

Arcade Mfg. Co., Freeport, Ill.
Atlas Mfg. Co., New Haven, Ct.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Chantrell Tool Co., Reading, Pa.
Doebler Mfg. Co., Middletown, Ct.
Griffin Mfg. Co., Allegheny, Pa.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Works, New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
T. F. Welch Mfg. Co., Boston, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.

BRACKETS, Shovel, Hoe, Rake, Fork, &c.—

Adams Co., Dubuque, Ia.
W. C. Heller & Co., Montclair, N. J.

BRACKETS, SOAP—See Household Articles, Wire.**BRACKETS, Store Fixture—**

I. S. Spencer's Sons, Gullford, Ct.

BRACKETS, Window Screen Corner—

Reading Hardware Co., Reading, Pa.

BRAD AWLS—See Awls, Peg, Brad, &c.

- BRADS, TACKS, FINISHING NAILS, &c.**—See Tacks, Brads, Finishing Nails, &c.
- BRAIDED ROPE, COTTON, LINEN, &c.**—See Rope, Braided, Cotton, Linen, &c.
- BRAKE CHAINS, SHOES**—See Chains, Shoes.
- BRAKES, Bicycle**—
Bevin Bros. Mfg. Co., E. Hampton, Ct.
- BRAKES Car**—
Consolidated Railway Electric Lighting & Equipment Co., Derby, Ct.
- BRAKES, Coaster Bicycle**—
Eclipse Bicycle Co., Elmira, N. Y.
- BRAKES, Electric**—
Electric Controller & Supply Co., Cleveland, O.
- BRACE BIT ATTACHMENT**—
L. T. Snow, New Haven, Ct.
- BRAND HEATING FURNACES**—See Furnaces, Brand Heating.
- BRANDS, Burning**—
L. A. Eucker Stamp Works, Little Ferry, N. J.
George M. Ness, 61 Fulton St., New York.
J. W. Paxson Co., Philadelphia, Pa.
Schwerdtle & Siebert, Bridgeport, Ct.
- BRASS AND COPPER RODS**—
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Merchant & Co., Philadelphia, Pa.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, New York.
- BRASS BEDSTEADS, BOLTS, &c.**—See Bedsteads, Bolts, &c.
- BRASS, Brazing**—
Plume & Atwood Mfg. Co., Waterbury Ct.
Scovill Mfg. Co., Waterbury, Ct.
- BRASS, Embossed or Figured**—
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
Waterbury Brass Co., Waterbury, Ct.
- BRASSES, Car**—
Magnolia Metal Co., 266 & 267 West St., New York.
J. J. Ryan & Co., Chicago, Ill.
- BRASS FINISHING MACHINERY**—
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
- BRASS FRAMED MIRRORS**—See Mirrors, Brass Framed.
- BRASS FURNITURE KNOBS**—See Knobs, Brass Furniture.
- BRASS, Hoop**—
Plume & Atwood Mfg. Co., Waterbury, Ct.
- BRASS INGOTS**—
H. M. Shimer & Co., Philadelphia, Pa.
- BRASS, Ornamental**—See Iron and Brass, Ornamental.
- BRASS, Perforated**—
Bridgeport Brass Co., Bridgeport, Ct.
Erdle & Schenck, Rochester, N. Y.
- BRASS QUADRANTS, SKYLIGHT**—See Quadrants, Brass Skylight.
- BRASS, Roll and Sheet**—
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, New York.
Scovill Mfg. Co., Waterbury, Ct.
E. C. Stroud & Co., Chicago, Ill.
Waterbury Brass Co., Waterbury, Ct.
- BRASS, Rule (Printers')**—
Plume & Atwood Mfg. Co., Waterbury, Ct.
- BRASS SHELLS, BLANKS, SEAMLESS AND SHOT**—See Shells.
- BRASS, Sign or Engravers'**—
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, New York.
- BRASS, Spring**—
Plume & Atwood Mfg. Co., Waterbury, Ct.
- BRASS, White**—
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
Paul S. Reeves & Son, Philadelphia, Pa.
- BRASS WORKING TOOLS**—See Tools, Brass Working.
- BRAZERS**—See Furnaces, Brazing.
- BRAZIERS' RIVETS, SOLDER**—See Rivets, Solder.
- BRAZING BRASS**—See Brass, Furnaces.
- BREAD BASKETS**—See Baskets, Silver Plated.
- BREAD BOARDS, KNIVES**—See Boards, Knives.
- BREAD COOLERS**—See Kitchen Articles, Wire.
- BREAK ARMS, PIN**—See Pin Break Arms.
- BREAKERS, Ice**—
V. Clad & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
- BREAKERS, Ice**—See Ice Harvesting Tools.
- BREAKERS, Skull**—
Thomas Carlin's Sons, Allegheny, Pa.
- BREAST DRILLS**—See Drills, Breast.
- BREECHING, Smoke Stack**—
Littleford Bros., Cincinnati, O.
- BREWERY MACHINERY**—
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
- BRICK, Acid Proof**—
Ostrander Fire Brick Co., Troy, N. Y.
- BRICK, Chemical Works**—
Ostrander Fire Brick Co., Troy, N. Y.
- BRICK CHISELS, DRILLS, &c.**—See Chisels, Drills, &c.
- BRICK DRIERS**—
American Blower Co., Detroit, Mich.
- BRICK, Enameled**—
Chas. Taylor's Sons Co., Cincinnati, O.
- BRICK, Fire**—
Cyrus Borgner, Philadelphia, Pa.
Cleveland Facing Mill Co., Cleveland, O.
Edward J. Etting, Philadelphia, Pa.
Gardner Bros., Cumberland, Md.
W. H. Haws Fire Brick Co., Mt. Union, Pa.
C. B. Houston & Co., Philadelphia, Pa.
Henry Maurer & Son, 420 East 23d St., New York.
Ostrander Fire Brick Co., Troy, N. Y.
J. W. Paxson Co., Philadelphia, Pa.
Poinier & Lester, Toledo, O.
Presbrey Stove Lining Co., Taunton, Mass.
Chas. Taylor's Sons Co., Cincinnati, O.
M. D. Valentine & Bro. Co., Woodbridge, N. J.
- BRICK, Glass Works**—
Ostrander Fire Brick Co., Troy, N. Y.
Poinier & Lester, Toledo, O.
M. D. Valentine & Bro. Co., Woodbridge, N. J.
- BRICK, Hollow**—
Henry Maurer & Son, 420 East 23d St., New York.
- BRICK MACHINERY**—
Thos. Carlin's Sons, Allegheny, Pa.
Chambers Bros. Co., Philadelphia, Pa.
Eastern Machinery Co., New Haven, Ct.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- BRICKS, Emery**—
Norton Emery Wheel Co., Worcester, Mass.
- BRICK, Stove Fire**—
Presbrey Stove Lining Co., Taunton, Mass.
M. D. Valentine & Bro. Co., Woodbridge, N. J.
- BRIDGE BOLTS, FLOORING, &c.**—See Bolts, Flooring, &c.
- BRIDGE MACHINERY**—
Bement, Miles & Co., Philadelphia, Pa.
Hilles & Jones Co., Wilmington, Del.
J. J. McCabe, 14 Day St., New York.
Niles Tool Works Co., Hamilton, O.
Prentice Bros., Worcester, Mass.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Vulcan Iron Works, Chicago, Ill.
- BRIDGE PINS**—
Finished Steel Co., Youngstown, O.
- BRIDGES**—See Buildings and Bridges.
- BRIDLE BITS**—See Bits, Bridle.
- BRINE HOOKS**—See Hooks, Brine.
- BROILER HEATERS**—See Heaters, Broilers.
- BROILERS**—
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Gas Stove Utensil Co., 73 Murray St., N. Y.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Schneider & Trenkamp Co., Cleveland, O.
Sidney Shepard & Co., Buffalo, N. Y.
Wire Goods Co., Worcester, Mass.
- BROKERS, IRON AND STEEL**—See Iron and Steel, Brokers and Merchants.
- BRONZE BOLTS, BUTTS, &c.**—See Bolts, Butts, &c.
- BRONZE FORGINGS, MANGANESE**—See Forgings, Manganese Bronze.
- BRONZE, Manganese**—
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.
Crescent-Phosphorized Metal Co., Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
- BRONZE METAL**—
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Theodore Hofeller & Co., Buffalo, N. Y.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
Arthur T. Rutter, 256 Broadway, New York.
Scovill Mfg. Co., Waterbury, Ct.
- BRONZE, Phosphor**—
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
Crescent-Phosphorized Metal Co., Philadelphia, Pa.
Nolte Brass Co., Springfield, O.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.
- BRONZE, Roll and Sheet**—
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Chas. H. Beasley & Co., Chicago, Ill.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Randolph-Clowes Co., Waterbury, Ct.
Paul S. Reeves & Son, Philadelphia, Pa.
E. H. Stroud & Co., Chicago, Ill.
- BRONZES, Ornamental**—
Goodwin & Kintz Co., Winsted, Ct.
- BROOM HOLDERS, RACKS**—See Holders, Racks, Broom.
- BROOMS, Steel, Wire, Fiber, &c.**—
Cleveland Facing Mill Co., Cleveland, O.
Osborn Mfg. Co., Cleveland, O.
- BROOMS, Track**—
Osborn Mfg. Co., Cleveland, O.
- BRUSH, COPPER**—See Copper, Com-mutator Brush.
- BRUSHES, Billiard Table**—
Osborn Mfg. Co., Cleveland, O.
- BRUSHES, Butchers', Packers'**—
Osborn Mfg. Co., Cleveland, O.

BRUSHES, Carbon Commutator—
General Electric Co., Schenectady, N. Y.

BRUSHES, Electroplating—
Hanson & Van Winkle Co., Newark, N. J.
Osborn Mfg. Co., Cleveland, O.
Zucker & Levett & Loeb Co., 526-530 West
25th St., New York.

BRUSHES, Foundry—
Cleveland Facing Mill Co., Cleveland, O.
Osborn Mfg. Co., Cleveland, O.

BRUSHES, Furnace and Heater—
Osborn Mfg. Co., Cleveland, O.

BRUSHES, Machine—
Osborn Mfg. Co., Cleveland, O.

BRUSHES, Silver Plated—
International Silver Co., 9-13 Maiden Lane,
New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.

BRUSHES, Steel Wire—
Chicago Flexible Shaft Co., Chicago, Ill.
Cleveland Facing Mill Co., Cleveland, O.
S. Obermayer Co., Cincinnati, O.
Osborn Mfg. Co., Cleveland, O.
J. W. Paxson Co., Philadelphia, Pa.

BRUSHES, Tumbler—
Osborn Mfg. Co., Cleveland, O.

**BRUSHES, Whitewash, Horse, Shoe,
&c.—**
Osborn Mfg. Co., Cleveland, O.
Palmer Hardware Mfg. Co., Troy, N. Y.

**BRUSHES, Wire, Casting, Gearing,
Flue, &c.—**
Chicago Flexible Shaft Co., Chicago, Ill.
Cleveland Facing Mill Co., Cleveland, O.
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Osborn Mfg. Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester,
Mass.

**BRUSHES, Wire, Horse, Hair, Cattle,
&c.—**
Osborn Mfg. Co., Cleveland, O.

BRUSHES, Wire Wheel—
S. Obermayer Co., Cincinnati, O.
Osborn Mfg. Co., Cleveland, O.

**BUCKET BLOCKS, PUMPS—See Blocks,
Pumps.**

BUCKETS AND CUPS, Elevator—
Aultman Co., Canton, O.
Avery Stamping Co., Cleveland, O.
Bethlehem Foundry & Machine Co., South
Bethlehem, Pa.
Buhl Malleable Co., Detroit, Mich.
W. J. Clark Co., Salem, O.
Cleveland Elevator Bucket Co., Cleveland.
Dodge Mfg. Co., Mishawaka, Ind.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.
Wm. B. Scaife & Sons, Pittsburgh, Pa.

BUCKETS, Chain, Pump, Rubber—
Cleveland Galvanizing Works, Cleveland.

BUCKETS, Factory—
W. J. Clark Co., Salem, O.
Cleveland Facing Mill Co., Cleveland, O.
Osborn Mfg. Co., Cleveland, O.

BUCKETS, Fire—
Howard & Morse, 45 Fulton St., New York.
Peerless Rubber Mfg. Co., 16 Warren St.,
New York.

BUCKETS, Hoisting—
Thomas Carlin's Sons, Allegheny, Pa.
Cleveland Elevator Bucket Co., Cleveland.
C. W. Hunt Co., West New Brighton, N. Y.

BUCKETS, Ore—
W. J. Clark Co., Salem, O.
Cleveland Elevator Bucket Co., Cleveland.
Heyl & Patterson, Pittsburgh, Pa.
Wm. B. Scaife & Son., Pittsburgh, Pa.

BUCKETS, Self Dumping—
Brown Hoisting & Conveying Machine Co.,
Cleveland, O.
W. J. Clark Co., Salem, O.
Heyl & Patterson, Pittsburgh, Pa.
Henry B. Newhall, 26 Cortlandt St., New
York.
Wm. B. Scaife & Sons, Pittsburgh, Pa.

BUCKLES, Belt—
W. & E. T. Fitch Co., New Haven, Ct.

BUCKLES, Cotton Tie—
Nut & Washer Mfg. Co., Milwaukee, Wis.

BUCKLES, Halter and Trace—
Covert's Saddlery Works, Farmer, N. Y.

BUCKLES, Trunk and Bag—
R. C. Jenkinson & Co., Newark, N. J.

BUCKS, Wood Saw—
E. C. Atkins Co., Indianapolis, Ind.
J. R. Clark Co., Minneapolis, Minn.
Henry Disston & Sons, Philadelphia, Pa.
Tucker & Dorsey Mfg. Co., Indianapolis,
Ind.

BUFFERS, Blacksmiths'—
Heller Bros. Co., Newark, N. J.

BUFFERS, Broom—
Edson Mfg. Co., Boston, Mass.

**BUFFER STEELS—See Steels, Buffer
and Scraper.**

**BUFFING AND POLISHING MA-
CHINES—**

C. H. Besly & Co., Chicago, Ill.
L. Best, 45 Vesey St., New York.
Bridgeport Safety Emery Wheel Co., Bridge-
port, Ct.
Chicago Flexible Shaft Co., Chicago, Ill.
Cross and Speirs Machine Co., Waterbury,
Ct.
Diamond Machine Co., Providence, R. I.
Divine Bros. Co., Utica, N. Y.
Garvin Mch. Co., Spring & Varick Sts.,
New York.
George Gorton Machine Co., Racine, Wis.
Hanson & Van Winkle Co., Newark, N. J.
Hill, Clarke & Co., Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St.,
New York.
Niles Tool Works Co., Hamilton, O.
Northampton Emery Wheel Co., Leeds,
Mass.
Prentiss Tool & Supply Co., 115 Liberty
St., New York.
Safety Emery Wheel Co., Springfield, O.
Scranton Corundum & Emery Wheel Co.,
Scranton, Pa.
Springfield Mfg. Co., Bridgeport, Ct.
Sterling Emery Wheel Co., Tiffin, O.
Stow Flexible Shaft Co., Philadelphia, Pa.
Waterbury Farrel Foundry & Mch. Co.,
Waterbury, Ct.
Watson-Stillman Co., 204-210 East 43d St.,
New York.
Webster & Perks Tool Co., Springfield, O.
Zucker & Levett & Loeb Co., 526-530 West
25th St., New York.

**BUFFING SUPPLIES—See Polishing
and Buffing Supplies.**

BUFFS—
Diamond Machine Co., Providence, R. I.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 West
25th St., New York.

**BUGGIES—See Vehicles, Buggies, Car-
riages, &c.**

BUGGIES, Cinder and Iron—
Thomas Carlin's Sons, Allegheny, Pa.

**BUILDING FRONTS—See Fronts, Build-
ing, Sheet Iron.**

BUILDING MATERIAL, Fire Proof—
Henry Maurer & Son, 420 East 23d St.,
New York.

BUILDINGS AND BRIDGES—
Allentown Rolling Mills, Allentown, Pa.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Belmont Iron Works, Philadelphia, Pa.
Berlin Iron Bridge Co., E. Berlin, Ct.
Bethlehem Foundry & Machine Co., South
Bethlehem, Pa.
Reed F. Blair & Co., Pittsburgh, Pa.
Boston Bridge Co., Boston, Mass.
J. B. & J. M. Cornell, 26th St. & 11th Ave.,
New York.
Forest City Steel & Iron Co., Cleveland, O.
Garry Iron & Steel Roofing Co., Cleveland,
O.
Illinois Steel Co., Chicago, Ill.
W. W. Lindsay & Co., Philadelphia, Pa.
Moseley Iron Bridge & Roof Co., 39 Cort-
landt St., New York.
National Iron & Wire Co., Cleveland, O.
Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.

Riter-Conley Mfg. Co., Pittsburgh, Pa.
A. & P. Roberts Co., Philadelphia, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Shiffler Bridge Co., Pittsburgh, Pa.
Stewart Iron Works, Cincinnati, O.
Van Dorn Iron Works Co., Cleveland, O.

BUILDINGS, Election Booth—
Van Dorn Iron Works Co., Cleveland, O.

BULLDOZERS—
Ajax Mfg. Co., Cleveland, O.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Williams, White & Co., Moline, Ill.

**BULL LEADERS, RINGS—See Leaders,
Rings.**

**BULL'S, DEAD, EYES, &c.—See Eyes,
Dead, Bull's, &c.**

BULL'S EYES OR LIZARDS, Floor—
W. & J. Tiebout, 118 Chambers St., N. Y.

**BUMPERS, WAGON SPRING—See
Springs, Wagon Rubber.**

**BUNG HEAD BOLTS—See Bolts, Spe-
cial.**

**BUNG HOLE BORERS—See Borers,
Bung Hole.**

BUNG STARTERS—See Starters, Bung.

**BURGLAR PROOF VAULTS—See
Vaults, Fire and Burglar Proof.**

BURNERS, Acetylene—
Drake Acetylene Apparatus Co., Cleveland,
O.

BURNERS, Fuel, Oil—
Wm. J. Browne, Philadelphia, Pa.
John M. Rogers Boat, Gauge & Drill Works,
Gloucester City, N. J.

BURNERS, Gasoline—
Schneider & Trenkamp Co., Cleveland, O.

BURNERS, Hydro-Carbon—
Manning, Maxwell & Moore, 85 Liberty St.,
New York.

BURNERS, Kerosene—
Bridgeport Brass Co., Bridgeport, Ct.
Edward Miller & Co., Meriden, Ct.
Plume & Atwood Mfg. Co., Waterbury, Ct.
John M. Rogers Boat, Gauge and Drill
Works, Gloucester City, N. J.
Scovill Mfg. Co., Waterbury, Ct.
Taplin Mfg. Co., Forestville, Ct.

BURNERS, Natural Gas—
Hollands Mfg. Co., Erie, Pa.
Schneider & Trenkamp Co., Cleveland, O.

BURNERS, Paint—
Schneider & Trenkamp Co., Cleveland, O.

**BURNING BRANDS—See Brands, Burn-
ing.**

BURNISHERS—
Charles Buck, Millbury, Mass.
Buck Bros., Millbury, Mass.
Tuck Mfg. Co., Brockton, Mass.

BURRING MACHINES, Nut—
National Machinery Co., Tiffin, O.

**BURRS, COPPER—See Rivets and
Burrs, Copper.**

BURRS, Steel—
American Screw Co., Providence, R. I.
Griffin Mfg. Co., Allegheny, Pa.
Nut & Washer Mfg. Co., Milwaukee, Wis.
See also Washers, Wrought.

BUSHED CHAINS—See Chains, Bushed.

BUSH HOOKS—See Hooks, Bush.

BUSHINGS, Pulley—
Boston & Lockport Block Co., Boston.
Dodge Mfg. Co., Mishawaka, Ind.

BUSHINGS, Seamless Steel—
Shelby Steel Tube Co., Cleveland, O.

**BUTCHER CLEAVERS, KNIVES, &c.—
See Cleavers, Knives, &c.**

BUTCHERS' TOOLS—
Henry Disston & Sons, Philadelphia, Pa.
L. & I. J. White Co., Buffalo, N. Y.

**BUTT AND RABBIT GAUGES—See
Gauges, Butt and Rabbit.**

- BUTTER BOXES, TUBS, &c.—See Boxes, Tubs, &c.**
- BUTTER DISHES—See Dishes, Silver Plated.**
- BUTTERISES, Blacksmiths'—**
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Wells Bros. & Co., Greenfield, Mass.
- BUTTER MAKING APPLIANCES—See Cheese and Butter Making Appliances.**
- BUTT MILLING AND DRILLING MACHINES—See Milling and Drilling Machines, Butt.**
- BUTTON BACK MACHINES—**
E. W. Bliss Co., Brooklyn, N. Y.
Mossberg & Granville Mfg. Co., Providence, R. I.
- BUTTON HEAD BOLTS—See Bolts, Special.**
- BUTTON HOLE CUTTERS—See Cutters, Button Hole.**
- BUTTON HOOKS, SILVER PLATED—See Hooks, Button, Silver Plated.**
- BUTTON MACHINERY—**
Gould & Eberhardt, Newark, N. J.
- BUTTONS, Door—**
Arcade Mfg. Co., Freeport, Ill.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
W. & J. Tiebout, 118 Chambers St., N. Y.
- BUTTONS, Push—**
W. R. Ostrander & Co., 22 Dey St., N. Y.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
I. S. Spencer's Sons, Guilford, Ct.
Star Bros. Bell Co., East Hampton, Ct.
- BUTTONS, UNIFORM—**
R. Woodman Mfg. & Supply Co., Boston.
- BUTTS AND HINGES, Brass—**
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Scovill Mfg. Co., Waterbury, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.
Union Mfg. Co., New Britain, Ct.
- BUTTS, Ball Bearing—**
Stanley Works, New Britain, Ct.
- BUTTS, Bronze—**
Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
- BUTTS, Cast Iron—**
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Taylor & Boggis Foundry Co., Cleveland, O.
Union Mfg. Co., New Britain, Ct.
- BUTTS, Wrought Steel—**
McKinney Mfg. Co., Allegheny, Pa.
Reading Hardware Co., Reading, Pa.
Stanley Works, New Britain, Ct.
Wheeling Hinge Co., Wheeling, W. Va.
- BUZZ PLANERS—See Planers, Buzz.**
- CABINET CLAMPS, LOCKS, &c.—See Clamps, Locks, &c.**
- CABINET HINGES—**
Reading Hardware Co., Reading, Pa.
- CABINETS, Filing—**
Globe-Wernicke Co., Cincinnati, O.
- CABINETS FOR BICYCLE EXTRAS—**
J. D. Warren Mfg. Co., Chicago, Ill.
- CABINETS, Hardware Store—**
J. D. Warren Mfg. Co., Chicago, Ill.
- CABINETS, Kitchen—**
J. R. Clark Co., Minneapolis, Minn.
- CABINETS, Tool—**
American Tool Chest Co., 200 W. Houston St., New York.
- CABLE CHAIN—See Chain, Crane, Cable, &c.**
- CABLE MACHINERY, Wire—**
Farrel Foundry & Mach. Co., Ansonia, Ct.
- CABLE RAILROADS—See Conveying Machinery.**
- CABLE RAILWAY MACHINERY—**
Robert Poole & Son Co., Baltimore, Md.
Robert Wetherill & Co., Chester, Pa.
- CABLES, ELECTRICAL—See Wires, Electrical.**
- CABLES, Submarine—**
American Steel & Wire Co., Chicago, Ill.
- CABLEWAYS, SUSPENSION—See Tramways, Wire Rope.**
- CAGES, Bird and Animal—**
Andrew B. Hendryx Co., New Haven, Ct.
Fred J. Meyers Mfg. Co., Hamilton, O.
- CAISSONS, STEEL—**
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
- CAKE BASKETS—See Baskets, Silver Plated.**
- CAKE PANS, TURNERS, &c.—See Pans, Turners, &c.**
- CALENDAR STANDS—See Stands, Calendar.**
- CALENDARS, Paper—**
Farrel Foundry & Mach. Co., Ansonia, Ct.
- CALENDARS, SILVER PLATED—See Desk Specialties.**
- CALIPERS—**
Athol Machine Co., Athol, Mass.
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings & Spencer Co., Hartford, Ct.
Brown & Sharpe Mfg. Co., Providence, R. I.
New England Specialty Co., North Easton, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pratt & Whitney Co., Hartford, Ct.
L. S. Starratt Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
- CALIPERS, Gear Tooth—**
Brown & Sharpe Mfg. Co., Providence, R. I.
- CALIPERS, Micrometer—**
Brown & Sharpe Mfg. Co., Providence, R. I.
- CALIPERS, Vernier—**
Brown & Sharpe Mfg. Co., Providence, R. I.
- CALKING IRONS—See Irons, Calking.**
- CALKING MALLETS—See Mallets, Calking.**
- CALKING TOOLS, Pneumatic Boiler—**
Chicago Pneumatic Tool Co., Chicago, Ill.
Standard Pneumatic Tool Co., Chicago, Ill.
- CALKS, Boot—**
Lufkin Rule Co., Saginaw, Mich.
Star Heel Plate Co., Newark, N. J.
- CALKS, Horseshoe, Self-Sharpening—**
Leonhardt & Co., Schoeneberg-Berlin, Germany.
- CALKS, Toe—**
P. F. Burke, Boston, Mass.
Leonhardt & Co., Schoeneberg-Berlin, Germany.
Rhode Island Perkins Horse Shoe Co., Providence, R. I.
- CALL BELLS—See Bells, Tea and Call.**
- CALLS, Dog—**
Waterbury Brass Co., Waterbury, Ct.
- CAM CUTTING ATTACHMENTS—**
Cincinnati Milling Machine Co., Cincinnati, O.
Niles Tool Works Co., Hamilton, O.
- CAMPAIGN HELMETS—See Helmets, Campaign.**
- CAMP STOOLS—See Stools, Camp.**
- CANDELABRA—See Candlesticks and Candelabra.**
- CANDLESTICKS—**
Keen & Hagerty Mfg. Co., Baltimore, Md.
Logan & Strobbridge Iron Co., New Brighton, Pa.
North Bros. Mfg. Co., Philadelphia, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Sidney Shepard & Co., Buffalo, N. Y.
- CANDLESTICKS AND CANDELABRA—**
Goodwin & Kintz Co., Winsted, Ct.
International Silver Co., 9-13 Maiden Lane, New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.
- CANDLESTICKS, Miners'—**
Ludlow-Saylor Wire Co., St. Louis, Mo.
- CANDLE WICKING—See Wicks, Candle.**
- CANDY PANS, SCALES, SCOOPS—See Pans, Scales, Scoops.**
- CANE KNIVES—See Knives, Cane.**
- CAN FAUCETS—See Faucets, Can.**
- CAN JACKETS—See Jackets, Can.**
- CAN MAKERS' MACHINERY—**
Adriance Machine Works, Brooklyn, N. Y.
E. W. Bliss Co., Brooklyn, N. Y.
Chas. Leffler & Co., Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
- CANNONS, Yacht—**
L. T. Snow, New Haven, Ct.
- CAN NOZZLES, OPENERS, SCREWS—See Nozzles, Openers, Screws.**
- CANOPIES AND CANOPY FIXTURES—**
I. E. Palmer, Middletown, Ct.
- CANOPY NETTINGS—See Nettings, Canopy.**
- CANS, Ash and Garbage—**
George Griffiths Co., Philadelphia, Pa.
Howard & Morse, 45 Fulton St., N. Y.
Littleford Bros., Cincinnati, O.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Sidney Shepard & Co., Buffalo, N. Y.
- CANS, Dredge Spice—**
Sidney Shepard & Co., Buffalo, N. Y.
- CANS, Ice, Galvanized Iron—**
Harrisburg Pipe Bending Co., Harrisburg, Pa.
Wm. B. Scalfé & Sons, Pittsburgh, Pa.
- CANS, Milk—**
Charles Millar & Son, Utica, N. Y.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Merchant & Co., Philadelphia, Pa.
Sidney Shepard & Co., Buffalo, N. Y.
- CANS, Oil—**
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.
- CANS, Paint and Varnish—**
Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.
- CANS, Tin—**
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.
- CAN STOCK, MILK—See Milk Can Stock.**
- CANS, Waste—**
W. J. Clark Co., Salem, O.
Howard & Morse, 45 Fulton St., N. Y.
- CANT HOOKS—See Hooks, Cant.**
- CAPE CHISELS—See Chisels, Cape.**
- CAPS AND VENTILATORS—**
W. & J. Tiebout, 118 Chambers St., N. Y.
- CAPS, BLASTING—**
King Powder Co., Cincinnati, O.

CAP SCREWS—See Screws, Cap and Set.

CAPS, DOOR AND WINDOW, Sheet Iron—

G. Drouve Co., Bridgeport, Ct.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.

CAPS, HOSE—See Hose Attachments.

CAPS, Percussion—

Union Metallic Cartridge Co., 313-315 Broadway, New York.
Waterbury Brass Co., Waterbury, Ct.

CAPS, Storm Sliding Doors—

Lane Brothers Co., Poughkeepsie, N. Y.

CAPSTANDS—

Edson Mfg. Co., Boston, Mass.

CAR AXLES, BEARINGS, &c.—See Axles, Bearings, &c.

CARBIDE OF SILICON—See Silicon, Carbide of.

CARBINES—See Rifles, Carabines, &c.

CARBON TONGS—See Tongs, Carbon.

CARBORUNDUM CLOTH—

Carborundum Co., Niagara Falls, N. Y.

CARBORUNDUM GRAINS—

Carborundum Co., Niagara Falls, N. Y.

CARD BASKETS, CASES, &c.—See Baskets, Cases, &c.

CARD CASES—See Cases, Card, Silver Plated.

CARD INDEXES—See Indexes, Card.

CAR DOOR EQUIPMENT—

Q. & C. Company, Chicago, Ill.

CAR DOOR PLATES—See Plates, Car Door.

CARD TRAYS—See Trays, Card, Silver Plated.

CAR FRAMES, Pressed Steel—

Avery Stamping Co., Cleveland, O.

CAR LINK MACHINES—

National Machinery Co., Tiffin, O.

CARPENTER SHOP MACHINERY—

American Machinery Co., Grand Rapids, Mich.
Egan Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.

CARPENTERS' CLAMPS, SLICKS—See Clamps, Slicks.

CARPET STRETCHERS—See Stretchers.

CAR PUSHERS—

Jos. F. McCoy Co., 26 Warren St., N. Y.

CARRIAGE AND WAGON HARDWARE—

Atwater Mfg. Co., Southington, Ct.
J. H. Baker Mfg. Co., Pittsburgh, Pa.
Consolidated Railway Electric Lighting & Equipment Co., Derby, Ct.
Covert's Saddlery Works, Farmer, N. Y.
Davis & Buxton Stamping Co., Worcester, Mass.
Houghton & Buxton Mfg. Co., Worcester, Mass.
M. Seward & Son Co., New Haven, Ct.
Walter W. Woodruff & Sons Co., Mt. Carmel, Ct.

CARRIAGE AXLES, BOLTS, &c.—See Axles, Bolts, &c.

CARRIAGES—See Vehicles, Buggies, Carriages, &c.

CARRIAGES, Gun—

Bethlehem Steel Co., S. Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
R. Poole & Son Co., Baltimore, Md.

CARRIAGES, MOTOR—See Motor Wagons and Carriages.

CARRIAGES, Trolley—

Trenton Iron Co., Trenton, N. J.

CARRIERS, Barb Wire—

Ludlow-Saylor Wire Co., St. Louis, Mo.

CARRIERS, Bicycle Luggage—

Wire Goods Co., Worcester, Mass.

CARRIERS, Endless Apron—

Buhl Malleable Co., Detroit, Mich.
Heyl & Patterson, Pittsburgh, Pa.
Link-Belt Engineering Co., Philadelphia.

CARRIERS, Feed and Ensilage—

J. K. Wilder & Sons, Monroe, Mich.

CARRIERS, Hand Hoist—

Henry B. Newhall, 26 Cortlandt St., N. Y.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

CARRIERS, HAY FORK—See Haying Tools.

CARRIERS, Trunk—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

CARRYING TRACK, OVERHEAD—See Track, Overhead Carrying.

CARS, Brick—

American Blower Co., Detroit, Mich.
Atlas Bolt & Screw Co., Cleveland, O.
Kilbourne & Jacobs Mfg. Co., Columbus, O.

CARS, Coal, Hotel, Kitchen—

Atlas Bolt & Screw Co., Cleveland, O.
V. Clad & Sons, Philadelphia, Pa.

CARS, Coal Mine, Pit, &c.—

Atlas Bolt & Screw Co., Cleveland, O.
C. W. Hunt Co., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.
Henry B. Newhall, 26 Cortlandt St., N. Y.

CARS, Core Oven—

Atlas Bolt & Screw Co., Cleveland, O.
Byram & Co., Detroit, Mich.
Kilbourne & Jacobs Mfg. Co., Columbus, O.

CARS, Dump—

Atlas Bolt & Screw Co., Cleveland, O.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Thos. Carlin's Sons, Allegheny, Pa.
W. J. Clark Co., Salem, O.
Jeffrey Mfg. Co., Columbus, O.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Henry B. Newhall, 26 Cortlandt St., N. Y.
Theodore Thomas, 11 Broadway, New York.
Trenton Iron Co., Trenton, N. J.

CARS, Electric—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.

CARS, Elevator—

J. E. Bolles Iron & Wire Works, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
Dow Wire Works Co., Louisville, Ky.
Littleford Bros., Cincinnati, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Ashland, O.
Scheeler's Sons, Buffalo, N. Y.
Stewart Iron Works, Cincinnati, O.
W. S. Tyler Co., Cleveland, O.

CARS, Foundry—

Atlas Bolt & Screw Co., Cleveland, O.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Byram Mfg. Co., Detroit, Mich.
C. W. Hunt Co., West New Brighton, N. Y.
Pennsylvania Engineering Works, New Castle, Pa.

CAR SHOP TOOLS—

American Tool Works Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Niles Tool Works Co., Hamilton, O.
Prentice Bros., Worcester, Mass.
Williams, White & Co., Moline, Ill.

CAR SHOP WOOD WORKING MACHINERY—

American Machinery Co., Grand Rapids, Mich.
J. A. Fay & Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.

CARS, Motor—

Jeffrey Mfg. Co., Columbus, O.

CARS, Railroad—

Atlas Bolt & Screw Co., Cleveland, O.
J. W. Hoffman & Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, N. Y.
Theodore Thomas, 11 Broadway, New York.

CARS, Railroad Hand—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

CARS, Rolling Mill—

Atlas Bolt & Screw Co., Cleveland, O.

CARS, Skip—

Edw. P. Allis Co., Milwaukee, Wis.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Pennsylvania Engineering Works, New Castle, Pa.
Wm. B. Pollock Co., Youngstown, O.

CARS, Tank—

Atlas Bolt & Screw Co., Cleveland, O.

CARS, Water and Acid Bosh—

Atlas Bolt & Screw Co., Cleveland, O.

CARTONS—

Folding Paper Box Co., South Bend, Ind.

CARTRIDGE MACHINES—

E. J. Manville Machine Co., Waterbury, Ct.

CARTRIDGES—

Peters Cartridge Co., Cincinnati, O.
Union Metallic Cartridge Co., 313-315 Broadway, New York.

CARTS, Barrel—

Sandwich Enterprise Co., Sandwich, Ill.

CARTS, Dump—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

CARTS, Lumber—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

CARTS, Push—

Fairbanks Co., 311 Broadway, New York.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Syracuse Chilled Plow Co., Syracuse, N. Y.
R. W. Whitehurst & Co., Norfolk, Va.

CARVERS' PUNCHES—See Punches, Carvers'.

CARVING TOOLS—

Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
Millers Falls Co., 28 Warren St., New York.

CAR WORKS MACHINERY—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Fox Machine Co., Grand Rapids, Mich.
Hilles & Jones Co., Wilmington, Del.
Niles Tool Works Co., Hamilton, O.

CAR WINDOW LOCKS—See Locks, Car Window.

CASE HARDENING BONE FURNACES—See Bone, Furnaces.

CASE HARDENING COMPOUND—

American Carburizing Co., 160 Pearl St., New York.

CASEMENT ADJUSTERS, FASTENERS—See Adjusters, Fasteners.

CASE SEALS—See Seals, Box and Case.

CASES, Book—

Globe-Wernicke Co., Cincinnati, O.

CASES, Card, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

CASES, Catalogue—

J. D. Warren Mfg. Co., Chicago, Ill.

CASES, Cigar and Cigarette—

Seovill Mfg. Co., Waterbury, Ct.

CASES, Cutlery—

J. D. Warren Mfg. Co., Chicago, Ill.

CASES, Display—

J. D. Warren Mfg. Co., Chicago, Ill.

CASES, Drill—

Cleveland Twist Drill Co., Cleveland, O.
New Process Twist Drill Co., Taunton, Mass.

CASES, Legal Blank—

Globe-Wernicke Co., Cincinnati, O.

CASES, Match—

International Silver Co., 9-13 Maiden Lane, New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.

CASES, Pigeon-Hole—

Globe-Wernicke Co., Cincinnati, O.

CASES, Railroad Ticket—

American Railway Supply Co., 24 Park Place, New York.

CASES, Screw and Bolt—A. H. Green, 22 Park place, New York.
W. C. Heller & Co., Montclair, N. J.
J. D. Warren Mfg. Co., Chicago, Ill.**CASES, Seed—**

W. C. Heller & Co., Montclair, N. J.

**CASH RECORDERS, Autographic—See
Recorders, Cash, Autographic.****CASH REGISTERS—See Registers,
Cash.****CASINGS, Steel Elevator—**

W. J. Clark Co., Salem, O.

**CASKETS, JEWEL, SILVER PLATED
—See Jewel Caskets, Silver Plated.****CASKS, Shipping—**

W. J. Clark Co., Salem, O.

CASTERS, Ball Bearing—

Standard Caster & Wheel Co., 316-326 East 23d St., New York.

CASTERS, Bed, Plate, &c.—Coleman Hardware Co., Chicago, Ill.
Palmer Hardware Mfg. Co., Troy, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Standard Caster & Wheel Co., 316-326 East 23d St., New York.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
Wrightsville Hardware Co., Wrightsville, Pa.**CASTERS, Dinner, Pickle, Salad, &c.,
Silver Plated.**

International Silver Co., 9-13 Maiden Lane, New York.

CASTERS, Stove—

Coleman Hardware Co., Chicago, Ill.

CASTERS, Truck—Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Sam'l C. Tatum Co., Cincinnati, O.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.**CASTING MACHINES, Pig Iron—**

Heyl & Patterson, Pittsburgh, Pa.

CASTINGS, Aluminum—Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
John W. Clark, Albany, N. Y.
Andrew B. Hendryx Co., New Haven, Conn.
Homer F. Livermore, Boston, Mass.
Lorain Foundry Co., Lorain, O.
Ferd Messmer Mfg. Co., St. Louis, Mo.
Pittsburgh Reduction Co., Pittsburgh, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.
Stover Mfg. Co., Freeport, Ill.**CASTINGS, Bench Leg—**Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Brown & Sharpe Mfg. Co., Providence, R. I.**CASTINGS, Bicycle—**

Stanley G. Flagg & Co., Philadelphia, Pa.

CASTINGS, Brass—Edw. P. Allis Co., Milwaukee, Wis.
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
John W. Clark, Albany, N. Y.
Concord Axle Co., Penacook, N. H.
J. B. & J. M. Cornell 26th St. & 11th Ave., New York.
Andrew B. Hendryx Co., New Haven, Ct.
Homer F. Livermore, Boston, Mass.
Lunkenheimer Company, Cincinnati, O.
Lorain Foundry Co., Lorain, O.
Ferd Messmer Mfg. Co., St. Louis, Mo.
Edward Miller & Co., Meriden, Ct.
Nolte Brass Co., Springfield, O.
North Bros. Mfg. Co., Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.**I. S. Spencer's Son, Gullford, Ct.**Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
Vulcan Iron Works, Chicago, Ill.
West Side Foundry Co., Troy, N. Y.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.**CASTINGS, Bronze—**Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
John W. Clark, Albany, N. Y.
Concord Axle Co., Penacook, N. H.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Andrew B. Hendryx Co., New Haven, Ct.
Homer F. Livermore, Boston, Mass.
Lorain Foundry Co., Lorain, O.
Lunkenheimer Company, Cincinnati, O.
Ferd Messmer Mfg. Co., St. Louis, Mo.
Edward Miller & Co., Meriden, Ct.
Murdoch Parlor Grate Co., Boston, Mass.
Nolte Brass Co., Springfield, O.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., Cleveland, O.**CASTINGS, Chrome Steel—**

Chrome Steel Works, Brooklyn, N. Y.

CASTINGS, Composition—J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
I. S. Spencer's Sons, Milford, Ct.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.**CASTINGS, Copper—**Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
Lorain Foundry Co., Lorain, O.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Paul S. Reeves & Son, Philadelphia, Pa.**CASTINGS, Delta Metal—**

Phosphor-Bronze Smelting Co., Philadelphia, Pa.

CASTINGS, Dynamo and Motor—

Union Steel Casting Co., Pittsburgh, Pa.

CASTINGS, Finished—Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
H. H. Franklin Mfg. Co., Syracuse, N. Y.**CASTINGS, Gray Iron—**Adams Co., Dubuque, Ia.
Albany Foundry Co., Albany, N. Y.
Baker Bros., Toledo, O.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
S. Cheney & Son, Manlius, N. Y.
Codling Mfg. Co., Bristol, Ct.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
W. M. Crane Co., 1131 Broadway, N. Y.
Diamond Drill & Machine Co., Birdsboro, Pa.
Geo. L. Estes, Rochester, N. Y.
Stanley G. Flagg & Co., Philadelphia, Pa.
Forest City Foundry & Mfg. Co., Cleveland.
Jarecki Mfg. Co., Erie, Pa.
Keagy & Lear Machine Co., Coshocton, O.
Homer P. Livermore, Boston, Mass.
Logan & Strobridge Iron Co., New Brighton, Pa.
J. McLain Co., Canton, O.
Charles Millar & Son, Utica, N. Y.
North Bros. Mfg. Co., Philadelphia, Pa.
Palmer & De Mooy Foundry Co., Cleveland, O.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Randolph Iron Co., Greenpoint, N. Y.
Geo. B. Sennett Co., Youngstown, O.
Sessions Foundry Co., Bristol, Ct.
Standard Foundry & Mfg. Co., Cleveland.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland, O.
Theodore Thomas, 11 Broadway, New York.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
Vulcan Iron Works, Chicago, Ill.
Weatherwax Mfg. Co., Boonton, N. J.
Wrightsville Hardware Co., Wrightsville, Pa.
York Mfg. Co., York, Pa.**CASTINGS, Gun Iron—**Philadelphia Roll & Machine Co., Philadelphia, Pa.
Robert Poole & Son Co., Baltimore, Md.
York Mfg. Co., York, Pa.**CASTINGS, Iron—**Allentown Rolling Mills, Allentown, Pa.
Baker Bros., Toledo, O.
E. P. Allis Co., Milwaukee, Wis.
Bausch & Harris Machine Tool Co., Springfield, Mass.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Lloyd Booth Co., Youngstown, O.
Barney & Reed Mfg. Co., Boston, Mass.
Reed F. Blair & Co., Pittsburgh, Pa.
Thos. Carlin's Sons, Allegheny, Pa.
John W. Clark, Albany, N. Y.
Codling Mfg. Co., Bristol, Ct.
Concord Axle Co., Penacook, N. H.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Diamond Drill & Machine Co., Birdsboro, Pa.Dubuque Machine Concern, Dubuque, Ia.
Enterprise Foundry Co., Cincinnati, O.
Farrel Foundry & Mach Co., Ansonia, Ct.
H. H. Franklin Mfg. Co., Syracuse, N. Y.
Stanley G. Flagg & Co., Philadelphia, Pa.
Frank-Kneeland Mach. Co., Pittsburgh, Pa.
F. W. Iredell, 26 Cortlandt St., New York.
Logan & Strobridge Iron Co., New Brighton, Pa.
Lorain Foundry Co., Lorain, O.
Wm. McFarland, Trenton, N. J.
Mesta Machine Co., Pittsburgh, Pa.
Chas. Millar & Son, Utica, N. Y.
Henry B. Newhall, 26 Cortlandt St., N. Y.
Palmer Bros., Mianus, Ct.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
F. R. Phillips Sons Co., Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
R. Poole & Sons Co., Baltimore, Md.
Randolph Iron Co., Greenpoint, N. Y.
Reading Foundry Co., Reading, Pa.
Roryersford Foundry & Machine Co., Roryersford, Pa.
Geo. B. Sennett Co., Youngstown, O.
Sessions Foundry Co., Bristol, Ct.
I. S. Spencer's Sons, Gullford, Ct.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland.
Theodore Thomas, 11 Broadway, New York.
United States Cast Iron Pipe & Foundry Co., Philadelphia, Pa.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
West Side Foundry Co., Troy, N. Y.
Robert Wetherill & Co., Chester, Pa.
R. W. Whitehurst & Co., Norfolk, Va.
R. D. Wood & Co., Philadelphia, Pa.
Youngstown Foundry & Machine Co., Youngstown, O.**CASTINGS, Locomotive and Car—**Theodore Thomas, 11 Broadway, New York.
Union Steel Casting Co., Pittsburgh, Pa.**CASTINGS, Malleable Iron—**Acme Malleable Iron Works, Buffalo, N. Y.
Arcade Malleable Iron Co., Worcester, Mass.
Buhl Malleable Co., Detroit, Mich.
Chisholm & Moore Mfg. Co., Cleveland, O.
W. & E. T. Fitch Co., New Haven, Ct.
Stanley G. Flagg & Co., Philadelphia, Pa.
Hammer & Co., Branford, Ct.
Helwig Mfg. Co., St. Paul, Minn.
Jarecki Mfg. Co., Erie, Pa.
Homer P. Livermore, Boston, Mass.
Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.
Star Heel Plate Co., Newark, N. J.
Walter W. Woodruff & Sons Co., Mt. Carmel, Pa.
York Mfg. Co., York, Pa.**CASTINGS, Manganese Bronze—**W. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.
J. J. Ryan & Co., Chicago, Ill.**CASTINGS, Man Hole, Cistern, Cover,
Sewer, Gutter, Crossing, &c.—**Baker Bros., Toledo, O.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Thos. Carlin's Sons, Allegheny, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Hess, Snyder & Co., Massillon, O.
Stover Mfg. Co., Freeport, Ill.**CASTINGS, ORNAMENTAL—See Iron,
Ornamental.**

CASTINGS, Phosphor-Bronze—

Nolte Brass Co., Springfield, O.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Paul S. Reeves & Son, Philadelphia, Pa.

CASTINGS, Plow—

R. W. Whitehurst & Co., Norfolk, Va.

CASTINGS, Rolling Mill—

Lloyd Booth Co., Youngstown, O.
Thos. Carlin's Sons, Allegheny, Pa.
Diamond Drill & Machine Co., Birdsboro, Pa.
Ferro-Carbon Casting Co., Philadelphia.
Frank-Kneeland Machine Co., Pittsburgh.
A. Garrison Foundry Co., Pittsburgh, Pa.
Lorain Foundry Co., Lorain, O.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Robert Poole & Son Co., Baltimore, Md.
Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.
Union Steel Castings Co., Pittsburgh, Pa.
Youngstown Foundry & Machine Co., Youngstown, O.

CASTINGS, Stamp Mill—

Chrome Steel Works, Brooklyn, N. Y.
Union Steel Castings Co., Pittsburgh, Pa.

CASTINGS, Steel—

Arcade Malleable Iron Co., Worcester, Mass.
Chester Steel Casting Co., Philadelphia.
Chrome Steel Works, Brooklyn, N. Y.
Denman & Davis, 5 Cliff St., New York.
Stanley G. Flagg & Co., Philadelphia, Pa.
Hercules Steel Casting Co., Harvey, Ill.
C. B. Houston & Co., Philadelphia, Pa.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
Lima Steel Castings Co., Lima, O.
Homer P. Livermore, Boston, Mass.
P. Hollingsworth, Morris, Philadelphia, Pa.
Mesta Machine Co., Pittsburgh, Pa.
New England Steel Castings Co., North Easton, Mass.
John B. Newkirk & Co., Philadelphia, Pa.
Otis Steel Co., Ltd., Cleveland, O.
Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.
Union Steel Castings Co., Pittsburgh, Pa.
Wm. H. Wallace & Co., 66 Broadway, New York.

CASTINGS, Stove—

Stover Mfg. Co., Freeport, Ill.

CASTINGS, Tinned—

Logan & Strobbridge Iron Co., New Brighton, Pa.

CASTINGS, Tunnel—

Pleuger & Henger Mfg. Co., St. Louis, Mo.

CASTINGS, Water Works—

Charles Millar & Son, Utica, N. Y.
R. Poole & Son Co., Baltimore, Md.
United States Cast Iron Pipe & Foundry Co., Philadelphia, Pa.
R. D. Wood & Co., Philadelphia, Pa.

CASTINGS, White Metal—

Andrew B. Hendryx Co., New Haven, Ct.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Paul S. Reeves & Son, Philadelphia, Pa.

CASTINGS, Wrought Iron—

National Tube Co., Pittsburgh, Pa.

CAST IRON ENAMELS—See Enamels, Acid Proof and Cast Iron.**CAST IRON NUTS—See Nuts, Cast Iron.****CAST WASHERS—See Washers, Cast.****CATALOGUE CASES, CABINETS—See Cases, Cabinets, Catalogue.****CATCH BASIN COVERS—See Covers, Catch Basin.****CATCHERS, Grass—**

Enterprise Mfg. Co., Philadelphia, Pa.
Ney Mfg. Co., Canton, O.
Philadelphia Lawn Mower Co., Philadelphia, Pa.
Supplee Hardware Co., Philadelphia, Pa.

CATCHERS, Mail—

Taylor & Boggis Foundry Co., Cleveland.

CATCHES AND FASTENERS, Refrigerator—

Arcade Mfg. Co., Freeport, Ill.
W. & J. Tiebout, 118 Chambers St., N. Y.

CATCHES, Cupboard—

Doebler Mfg. Co., Middletown, Ct.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Taylor & Boggis Foundry Co., Cleveland.
W. & J. Tiebout, 118 Chambers St., N. Y.
Van Wagoner & Williams Hdw. Co., Cleveland, O.

CATCHES, Door—

Ney Mfg. Co., Canton, O.

CATCHES, Elbow—

Ney Mfg. Co., Canton, O.
Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

CATCHES, Screen Door—

Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

CATCHES, Showcase—

Reading Hardware Co., Reading, Pa.

CATCHES, Transom—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

CATCHES, Window—

Caldwell Mfg. Co., Rochester, N. Y.
Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.

CATTLE LEADERS, PRODS, &c.—See Leaders, Prods, &c.**CAULKING CHISELS—See Chisels, Caulking.****CEDAR KEGS—See Kegs, Cedar.****CEILING AND SIDING, Iron and Steel—**

Cincinnati Corrugating Co., Cincinnati, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Merchant & Co., Philadelphia, Pa.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Youngstown Iron & Steel Roofing Co., Youngstown, O.

CEILING HOOKS—See Hooks, Chandelier or Lamp.**CEILING PULLEYS—See Pulleys, Ceiling.****CEILINGS, Metal—**

Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.

CEMENT—

Reed F. Blair & Co., Pittsburgh, Pa.

CEMENT, Belting—

Shultz Belting Co., St. Louis, Mo.

CEMENT, Crockery—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

CEMENT DRILLS—See Drills, Brick and Cement.**CEMENT MACHINERY—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

CEMENT, Roofing—

Garry Iron & Steel Roofing Co., Cleveland, O.

CEMENT, Rubber—

Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

CENTER DRILLS, GAUGES, INDICATORS, TESTERS—See Drills, Gauges, Indicators, Testers.**CENTER GRINDERS, LATHE—See Grinders, Lathe Center.****CENTERING CHUCKS—See Chucks, Centering.****CENTERING MACHINES—**

Rement, Miles & Co., Philadelphia, Pa.
Hill, Clarke & Co., Boston, Mass.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
D. E. Whiton Machine Co., New London, Ct.
Woodward & Rogers, Hartford, Ct.

CENTERS, Indexing—

Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Milling Machine Co., Cincinnati, O.
Garvin Machine Co., Spring & Varick Sts., New York.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

CENTERS, Neck Yoke—

Covert's Saddlery Works, Farmer, N. Y.

CENTERS, Planer—

Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

CENTERS, Sash and Transom—

John C. Kupferle, St. Louis, Mo.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Wrightsville Hdw. Co., Wrightsville, Pa.

CESSPOOLS—

John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

CHAFING DISHES—See Dishes, Chafing.**CHAIN BARS, BICYCLE—See Bicycle Chain Bars.****CHAIN BELTING, HOISTS, &c.—See Belting, Hoists, &c.****CHAIN, Bicycle—**

Boston Gear Works, Boston, Mass.
Bridgeport Chain Co., Bridgeport, Ct.
Chantrell Tool Co., Reading, Pa.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
New Britain Hardware Mfg. Co., New Britain, Ct.

CHAIN, Binding—

Garland Chain Co., Rankin Station, Pa.

CHAIN, Brake—

Garland Chain Co., Rankin Station, Pa.
Jeffrey Mfg. Co., Columbus, O.
Jas. McKay & Co., Pittsburgh, Pa.
Monongahela Iron & Steel Co., Pittsburgh, Pa.

CHAIN, Coil—

American Steel & Wire Co., Chicago, Ill.
Bradlee & Co., Philadelphia, Pa.
Bridgeport Chain Co., Bridgeport, Ct.
Garland Chain Co., Rankin Station, Pa.
Jenkins Iron & Tool Co., Howard, Pa.
James McKay & Co., Pittsburgh, Pa.
Onelda Community, Niagara Falls, N. Y.
John C. Schmidt & Co., York, Pa.

CHAIN, Crane, Cable, &c.—

Bradlee & Co., Philadelphia, Pa.
Flier & Stowell Co., Milwaukee, Wis.
Garland Chain Co., Rankin Station, Pa.
C. W. Hunt Co., West New Brighton, N. Y.
Jenkins Iron & Tool Co., Howard, Pa.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
James McKay & Co., Pittsburgh, Pa.
Monongahela Iron & Steel Co., Pittsburgh, Pa.

CHAIN, Jack, Safety, &c.—

Ames Sword Co., Chicopee, Mass.
Bridgeport Brass Co., Bridgeport, Ct.
Bridgeport Chain Co., Bridgeport, Ct.
Hale Bros., Worcester, Mass.
A. B. Hendryx & Co., New Haven, Ct.
U. T. Hungerford Brass & Copper Co., 12 Worth St., N. Y.
McNab & Harlin Mfg. Co., 56 John St., New York.
Onelda Community, Niagara Falls, N. Y.
Ossawan Mills Co., Norwich, Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Seovill Mfg. Co., Waterbury, Ct.
Wire Goods Co., Worcester, Mass.
Wright & Colton Wire Cloth Co., Worcester, Mass.

CHAIN LINKS AND CHAIN—

Aultman Co., Canton, O.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Buhl Malleable Co., Detroit, Mich.
 Flier & Stowell Co., Milwaukee, Wis.
 Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
 Heyl & Patterson, Pittsburgh, Pa.
 Jeffrey Mfg. Co., Columbus, O.
 Keystone Drop Forge Co., Philadelphia.
 Kidd Bros. & Burgher Steel Wire Co., McKees Rocks, Pa.
 Monongahela Iron & Steel Co., Pittsburgh, Pa.
 Rhode Island Tool Co., Providence, R. I.
 Singer, Nimick & Co., Pittsburgh, Pa.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
 Wilson & Smith, Worcester, Mass.

CHAIN LINKS, CUTTERS FOR SAWING BICYCLE—See Bicycle Chain Links, Cutters for Sawing.**CHAIN MACHINERY—**

Cross & Speirs Machine Co., Waterbury Ct.
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

CHAIN MACHINERY, Bicycle—

E. W. Bliss Co., Brooklyn, N. Y.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Pratt & Whitney Co., Hartford, Ct.

CHAIN POT CLEANERS—See Kitchen Articles, Wire.**CHAIN, Pump—**

Cleveland Galvanizing Works, Cleveland.
 Garland Chain Co., Rankin Station, Pa.

CHAIN PUMP FIXTURES—See Pump Fixtures, Chain.**CHAIN PUMP TUBING—See Tubing, Chain, Pump.****CHAINS, Agricultural—**

Garland Chain Co., Rankin Station, Pa.
 Oneida Community, Niagara Falls, N. Y.

CHAINS AND LOCKS, Baggage—

Ames Sword Co., Chicopee, Mass.

CHAINS, Bicycle—

Reading Screw Co., Norristown, Pa.

CHAINS, Bushed—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Heyl & Patterson, Pittsburgh, Pa.
 Jeffrey Mfg. Co., Columbus, O.
 Link-Belt Engineering Co., Philadelphia.

CHAINS, Dog and Halter—

Bridgeport Chain Co., Bridgeport, Ct.
 Covert Mfg. Co., Troy, N. Y.
 Garland Chain Co., Rankin Station, Pa.
 Oneida Community, Niagara Falls, N. Y.
 Wire Goods Co., Worcester, Mass.

CHAINS, Flat Link—

Bridgeport Chain Co., Bridgeport, Ct.
 Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
 Thomas Morton, 65 Elizabeth St., N. Y.
 Henry B. Newhall, 26 Cortlandt St., N. Y.
 Oneida Community, Niagara Falls, N. Y.
 Smith & Egge Mfg. Co., Bridgeport, Ct.

CHAINS, Harness—

Bridgeport Chain Co., Bridgeport, Ct.
 Covert's Saddlery Works, Farmer, N. Y.
 Oneida Community, Niagara Falls, N. Y.
 John C. Schmidt & Co., York, Pa.

CHAINS, Heel—

John C. Schmidt & Co., York, Pa.

CHAINS, Hobbler—

John C. Schmidt & Co., York, Pa.

CHAINS, Hydrant—

Bridgeport Chain Co., Bridgeport, Ct.
 Oneida Community, Niagara Falls, N. Y.

CHAINS, Ice Elevator—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
 Rhode Island Tool Co., Providence, R. I.

CHAINS, Key—

Ames Sword Co., Chicopee, Mass.
 Bridgeport Chain Co., Bridgeport, Ct.
 Oneida Community, Niagara Falls, N. Y.
 Smith & Egge Mfg. Co., Bridgeport, Ct.
 L. T. Snow, New Haven, Ct.

CHAINS, Ladder—

Ossawan Mills Co., Norwich, Ct.

CHAINS, Log, Detachable—

Buhl Malleable Co., Detroit, Mich.
 Heyl & Patterson, Pittsburgh, Pa.
 Jeffrey Mfg. Co., Columbus, O.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

CHAINS, Log, Rafting, &c.—

American Steel & Wire Co., Chicago, Ill.
 Bradlee & Co., Philadelphia, Pa.
 Garland Chain Co., Rankin Station, Pa.
 Jas. McKay & Co., Pittsburgh, Pa.
 Monongahela Iron & Steel Co., Pittsburgh, Pa.
 John C. Schmidt & Co., York, Pa.

CHAINS, Picket, Stake, &c.—

Bridgeport Chain Co., Bridgeport, Ct.
 Garland Chain Co., Rankin Station, Pa.
 Oneida Community, Niagara Falls, N. Y.

CHAINS, Picture—

Bridgeport Chain Co., Bridgeport, Ct.
 Oneida Community, Niagara Falls, N. Y.

CHAINS, Sash, and Attachments—

Bridgeport Chain Co., Bridgeport, Ct.
 Chantrell Tool Co., Reading, Pa.
 Thomas Morton, 65 Elizabeth St., N. Y.
 Oneida Community, Niagara Falls, N. Y.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Smith & Egge Mfg. Co., Bridgeport, Ct.
 Wire Goods Co., Worcester, Mass.

CHAINS, Sling—

Bradlee & Co., Philadelphia, Pa.

CHAINS, Stud—

Bradlee & Co., Philadelphia, Pa.
 Jas. McKay & Co., Pittsburgh, Pa.

CHAINS, Trace—

American Steel & Wire Co., Chicago, Ill.
 Bridgeport Chain Co., Bridgeport, Ct.
 Garland Chain Co., Rankin Station, Pa.
 Oneida Community, Niagara Falls, N. Y.
 John C. Schmidt & Co., York, Pa.

CHAINS, Transom—

Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

CHAINS, Wagon and Fancy—

American Steel & Wire Co., Chicago, Ill.
 Bridgeport Chain Co., Bridgeport, Ct.
 Garland Chain Co., Rankin Station, Pa.
 Jas. McKay & Co., Pittsburgh, Pa.
 Oneida Community, Niagara Falls, N. Y.
 John C. Schmidt & Co., York, Pa.

CHAINS, Weldless—

Oneida Community, Niagara Falls, N. Y.

CHAINS, Well—

Garland Chain Co., Rankin Station, Pa.
 Oneida Community, Niagara Falls, N. Y.
 John C. Schmidt & Co., York, Pa.
 Union Mfg. Co., New Britain, Ct.

CHAIR AND BRACKET FACTORY MACHINERY—

Egan Co., Cincinnati, O.

CHAIR BOTTOM KNIVES—See Knives, Machine.**CHAIRS AND SETTEES, Lawn—**

Columbus Wire & Iron Works, Columbus, O.
 Edward Darby & Sons, Philadelphia, Pa.
 Ellis & Halfenbarger, Indianapolis, Ind.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Goshen Mfg. Co., Goshen, Ind.
 Howard & Morse, 45 Fulton St., N. Y.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Sandwich Enterprise Co., Sandwich, Ill.
 Scheeler's Sons, Buffalo, N. Y.
 Stewart Iron Works, Cincinnati, O.
 Van Dorn Iron Works Co., Cleveland, O.
 R. W. Whitehurst & Co., Norfolk, Va.

CHAIRS AND STOOLS, Office—

Globe-Wernicke Co., Cincinnati, O.

CHAIRS, Step ladder—

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

CHALK LINE REELS—See Reels, Chalk Line.**CHALK LINES—See Lines, Chalk, Masons', &c.****CHAMFERING MACHINES, DIE—See Die Chamfering Machines.****CHANDELIER HOOKS—See Hooks, Chandelier.****CHANDELIERS, Oil—**

Edward Miller & Co., Meriden, Ct.

CHANDLERY, SHIP, HARDWARE—See Ship Chandlery Hardware.**CHANNELING MACHINES—**

Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
 F. R. Patch Mfg. Co., Rutland, Vt.
 Rand Drill Co., 100 Broadway, New York.

CHANNELS—See Beams and Channels.**CHANNEL, SHOE AND COBBLERS' NAILS—See Nails, Shoe, Cobblers', Channel, &c.****CHAPLETS—See Bolts, Anchor.****CHARCOAL, Filtering—**

Cleveland Facing Mill Co., Cleveland, O.
 S. Obermayer Co., Cincinnati, O.

CHARCOAL TIN PLATES—

American Tin Plate Co., Battery Park Building, New York.

CHARMS—See Emblems, Charms, &c.**CHECK PUNCHES—See Punches, Check.****CHECK ROWER WIRE—See Wire, Check Rower.****CHECKS, Baggage, Key, &c.—**

American Railway Supply Co., 24 Park Place, New York.
 Bridgeport Chain Co., Bridgeport, Ct.
 L. A. Eucker Stamp Works, Little Ferry, N. J.
 Hoggson & Pettis Mfg. Co., New Haven, Ct.
 Geo. M. Ness, 61 Fulton St., New York.
 Schwerdtle & Siebert, Bridgeport, Ct.
 Scovill Mfg. Co., Waterbury, Ct.
 John Toler, Sons & Co., Newark, N. J.
 R. Woodman Mfg. & Supply Co., Boston.

CHECKS, Door—

Jos. Bardsley, 147-151 Baxter St., N. Y.
 Caldwell Sash Balance Co., Rochester, N. Y.
 Larimer Mfg. Co., Latrobe, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

CHECKS, DOOR, Liquid—

Joseph Bardsley, 147 Baxter St., N. Y.
 John Toler, Sons & Co., Newark, N. J.

CHECKS, Plantation—

American Railway Supply Co., 24 Park Place, New York.

CHECKS, Repair—

Star Heel Plate Co., Newark, N. J.

CHECKS, Time—

American Railway Supply Co., 24 Park Place, New York.
 R. Woodman Mfg. & Supply Co., Boston.

CHEESE FACTORY SCALES—See Scales, Cheese.**CHEESE KNIVES, SAFES, &c.—See Knives, Safes, &c.****CHEESE KNIVES, SELF GAUGING—See Knives, Cheese, Self Gauging.****CHEMICALS, Electroplating—**

Hansen & Van Winkle Co., Newark, N. J.
 Zucker & Levett & Loeb Co., 529-530 West 25th St., New York.

CHERRY SEEDERS AND STONERS—See Stoners.**CHEST HANDLES AND HINGES—See Handles, Hinges.****CHESTS, Tool—**

American Tool Chest Co., 200 West Houston St., New York.
 R. Bliss Mfg. Co., Pawtucket, R. I.
 C. E. Jennings Co., 101 Reade St., N. Y.
 Millers Falls Co., 28 Warren St., New York.

CHILDREN'S CUPS—See Cups, Silver Plated.**CHILDREN'S TRAYS—See Trays, Silver Plated.****CHILD'S SWINGS—See Swings, Child's.**

CHIMES, Church and Band—

Bevin Bros. Mfg. Co., East Hampton, Ct.

CHIMNEY CAPS—See Ventilators and Chimney Caps.**CHIMNEY CLEANERS, LAMP—See Cleaners, Lamp Chimney.****CHIMNEYS, Steel—**

Thomas Carlin's Sons, Allegheny, Pa.
W. J. Clark Co., Salem, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
W. W. Lindsay & Co., Philadelphia, Pa.
Littleford Bros., Cincinnati, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. B. Sealie & Sons, Pittsburgh, Pa.
Wickes Bros., Saginaw, Mich.

CHIMNEY TOPS—See Tops, Chimney, Revolving.**CHIPPERS, Ice—**

North Bros. Mfg. Co., Philadelphia, Pa.

CHISEL GAUGES, GRINDERS, HANDLES—See Gauges, Grinders, Handles.**CHISELS AND GOUGES, Socket—**

Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
C. E. Jennings Co., 101 Reade St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. & I. J. White Co., Buffalo, N. Y.

CHISELS AND GOUGES, Tanged—

Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. & I. J. White Co., Buffalo, N. Y.

CHISELS, Box—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

CHISELS, Cold—

Billings & Spencer Co., Hartford, Ct.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Buck Bros., Milbury, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Snell Mfg. Co., Fliskdale, Mass.
Transue & Williams Co., Alliance, O.
Tuck Mfg. Co., Brockton, Mass.
Wheeling Hinge Co., Wheeling, W. Va.

CHISELS, Floor and Rippling—

Braunsdorf-Mueller Co., Elizabeth, N. J.

CHISELS, Hot—

Heller Bros. Co., Newark, N. J.

CHISELS, Ice—

Logan & Strobbridge Iron Co., New Brighton, Pa.
Stover Mfg. Co., Freeport, Ill.
A. C. Williams, Ravenna, O.

CHISELS, Ice—See Ice Harvesting Tools.**CHISELS, TOY—See Toy Chisels.****CHISELS, Track—**

Van Wagoner & Williams Hardware Co., Cleveland, O.

CHISELS, Wire—

Niagara Machine & Tool Works, Buffalo, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

CHOCOLATE POTS—See Pots, Silver Plated.**CHOPPERS—See Cutters, Meat and Vegetable.****CHRISTMAS TREE HOLDERS—See Holders, Christmas Tree.****CHROME-NICKEL—**

Geo. G. Blackwell Sons Co., Liverpool, Eng.

CHUCKING AND TURNING MACHINES, Automatic—

Potter & Johnson Co., Pawtucket, R. I.

CHUCKING MACHINES—

Brown & Sharpe Mfg. Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Potter & Johnson Co., Pawtucket, R. I.
Pratt & Whitney Co., Hartford, Ct.
Windsor Machine Co., Windsor, Ct.

CHUCKS—

Cushman Chuck Co., Hartford, Ct.
Doebler Mfg. Co., Middletown, Ct.
Dwight Slate Machine Co., Hartford, Ct.
Garvin Machine Co., Spring & Varick Sts., New York.
E. Harrington, Son & Co., Philadelphia.
Hill, Clarke & Co., Boston, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
E. Horton & Son Co., Windsor Locks, Ct.
Ideal Machine Works, Hartford, Ct.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Haven Mfg. Co., New Haven, Ct.
Norton Emery Wheel Co., Worcester, Mass.
A. B. Pitkin Machinery Co., Providence, R. I.
Pratt Chuck Co., Frankfort, N. Y.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Skinner Chuck Co., New Britain, Ct.
Standard Tool Co., Cleveland, O.
Union Mfg. Co., New Britain, Ct.
D. E. Whiton Mach. Co., New London, Ct.

CHUCKS, Centering—

Cushman Chuck Co., Hartford, Ct.
Niles Tool Works Co., Hamilton, O.

CHUCKS, Drill—

R. H. Brown & Co., New Haven, Ct.
Cleveland Twist Drill Co., Cleveland, O.
Cushman Chuck Co., Hartford, Ct.
Doebler Mfg. Co., Middletown, Ct.
Goodell-Pratt Co., Greenfield, Mass.
Hill, Clarke & Co., Boston, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
E. Horton & Son Co., Windsor Locks, Ct.
C. E. Jennings Co., 101 Reade St., N. Y.
William G. Le Count, South Norwalk, Ct.
Millers Falls Co., 28 Warren St., New York.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Niles Tool Works Co., Hamilton, O.
Pratt Chuck Co., Frankfort, N. Y.
Pratt & Whitney Co., Hartford, Ct.
Skinner Chuck Co., New Britain, Ct.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Union Mfg. Co., New Britain, Ct.
D. E. Whiton Mach. Co., New London, Ct.
Wiley & Russell Mfg. Co., Greenfield, Mass.

CHUCKS, Lathe—

Cushman Chuck Co., Hartford, Ct.
E. Harrington, Son & Co., Philadelphia.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
E. Horton & Son Co., Windsor Locks, Ct.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Skinner Chuck Co., New Britain, Ct.
Union Mfg. Co., New Britain, Ct.
D. E. Whiton Machine Co., New London, Ct.

CHUCKS, Milling Machine—

E. Horton & Son Co., Windsor Locks, Ct.
Niles Tool Works Co., Hamilton, O.

CHUCKS, Planer—

Geo. Burnham & Co., Worcester, Mass.
Fox Machine Co., Grand Rapids, Mich.
E. Harrington, Son & Co., Philadelphia.
Hill, Clarke & Co., Boston, Mass.
Hollands Mfg. Co., Erie, Pa.
New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works Co., Hamilton, O.
Pedrick & Ayer Co., Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
Skinner Chuck Co., New Britain, Ct.
Tower & Lyon, 95 Chambers St., N. Y.

CHUCKS, Spinning—

E. W. Bliss Co., Brooklyn, N. Y.

CHUCKS, Wire—

T. F. Welch Mfg. Co., Boston, Mass.

CHURCH CHIMES—See Chimes, Church and Band.**CHURNS—**

Aspinwall Mfg. Co., Jackson, Mich.
Anthony Wayne Mfg. Co., Fort Wayne, Ind.

CHUTES, Coal—

C. W. Hunt Co., West New Brighton, N. Y.
Wm. B. Pollock Co., Youngstown, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Williams, White & Co., Moline, Ill.

CHUTES, Garbage—

Hill Dryer Co., Worcester, Mass.

CIDER MILLS—See Mills, Cider.**CIDER MILL TEETH—See Teeth, Cider Mill.****CIGAR BOXES, CASES, &c.—See Boxes, Cases, &c.****CINDER, Mill—**

F. Griner, Philadelphia, Pa.
B. Nicoll & Co., 66 Wall St., New York.
Pilling & Crane, Philadelphia, Pa.

CIRCULAR SAW BENCH—See Bench, Circular Saw.**CIRCULAR SAWS—See Saws, Circular.****CISTERN PUMPS—See Pumps, Cistern.****CLAM HOOKS—See Hooks, Clam.****CLAMP DOGS, DRILLS—See Dogs, Drills.****CLAMPS AND SLIDES, Rope—**

Covert's Saddlery Works, Farmer, N. Y.

CLAMPS, Belt—

Billings & Spencer Co., Hartford, Ct.
R. Bliss Mfg. Co., Pawtucket, R. I.
Dodge Mfg. Co., Mishawaka, Ind.

CLAMPS, Cabinet, Carpenters', Machinists', &c.

Armstrong Mfg. Co., Bridgeport, Ct.
Athol Machine Co., Athol, Mass.
Billings & Spencer Co., Hartford, Ct.
R. Bliss Mfg. Co., Pawtucket, R. I.
Grand Rapids Hardware Co., Grand Rapids, Mich.
Hammer & Co., Branford, Ct.
Logan & Strobbridge Iron Co., New Brighton, Pa.
G. A. Milbradt & Co., St. Louis, Mo.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Stover Mfg. Co., Freeport, Ill.
Sam'l C. Tatum Co., Cincinnati, O.
T. F. Welch Mfg. Co., Boston, Mass.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

CLAMPS, Cable Carriers—See Collars and Clamps.**CLAMPS, Carriage—**

Reading Hardware Co., Reading, Pa.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

CLAMPS, Flanging—

Hilles & Jones Co., Wilmington, Del.

CLAMPS, Girder—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Geo. V. Cresson Co., Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.

CLAMPS, HOSE—See Hose Attachments.**CLAMPS, Key Seat—**

Hoggson & Pettis Mfg. Co., New Haven, Ct.

CLAMPS, Parallel—

Chas. H. Besly & Co., Chicago, Ill.

CLAMPS, Saw—

Henry Disston & Sons, Philadelphia, Pa.
Reading Hardware Co., Reading, Pa.

CLAMPS, Steel—

W. G. Le Count, South Norwalk, Ct.

CLAMPS, Toolmakers'—

Springfield Machine Screw Co., Springfield, Mass.
L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

CLAMPS, Trunk—

R. C. Jenkinson & Co., Newark, N. J.

CLAMPS, Vise—

Prentiss Vise Co., 44 Barclay St., N. Y.

CLAMPS, Wire Rope—

A. Leschen & Sons Rope Co., St. Louis, Mo.

CLAPBOARD GAUGES, MARKERS—See Gauges, Markers.**CLASPS, Hoop and Pail—**

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.
E. H. Titchener & Co., Binghamton, N. Y.

CLAWS, Coal—

Logan & Strobbridge Iron Co., New Brighton, Pa.

CLAWS, Nail—

Wheeling Hinge Co., Wheeling, W. Va.

CLAWS, Tack—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Bridgeport Mfg. Co., Bridgeport, Ct.
John H. Graham & Co., 113 Chambers St., New York.

Keystone Drop Forge Co., Philadelphia, Pa.
Logan & Strobridge Iron Co., New Brighton, Pa.

H. H. Mayhew Co., Shelburne Falls, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

J. H. Williams & Co., Brooklyn, N. Y.
Wrightsville Hardware Co., Wrightsville, Pa.

CLAY, Fire—

Cleveland Facing Mill Co., Cleveland, O.
Cyrus Borgner, Philadelphia, Pa.
Henry Maurer & Son, 420 E. 23d St., N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
J. W. Paxson Co., Philadelphia, Pa.
Chas. Taylor's Sons Co., Cincinnati, O.
M. D. Valentine & Bro. Co., Woodbridge, N. J.

CLAY PIGEONS—See Pigeons, Clay.**CLAY WORKING MACHINERY—**

Chambers Bros. & Co., Philadelphia, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

CLEANERS, Comb—

Gay & Parsons, Augusta, Me.

CLEANERS, Drain—

Ney Mfg. Co., Canton, O.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.

CLEANERS, File—

Nicholson File Co., Providence, R. I.

CLEANERS, Flue—

Jackson Flue Scraper Co., Jackson, Mich.
Jenkins Bros., 71 John St., New York.
Millers Falls Co., 28 Warren St., New York.
Osborn Mfg. Co., Cleveland, O.
J. W. Paxson Co., Philadelphia, Pa.
Pedrick & Ayer Co., Philadelphia, Pa.
Wire Goods Co., Worcester, Mass.

CLEANERS, Lamp Chimney—

Fred. J. Meyers Mfg. Co., Hamilton, O.

CLEANERS, Sidewalk—

Ely Hoe & Fork Co., St. Johnsbury, Vt.
Iowa Farming Tool Co., Fort Madison, Ia.
Jenkins Iron & Tool Co., Howard, Pa.
Palmer Hardware Mfg. Co., Troy, N. Y.
Withington & Cooley Mfg. Co., Jackson, Mich.

CLEANERS, Sink—

Osborn Mfg. Co., Cleveland, O.

CLEARER SPRINGS—See Springs, Clearer.**CLEATS, Line and Rope—**

Reading Hardware Co., Reading, Pa.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
R. W. Whitehurst & Co., Norfolk, Va.

CLEAVERS, Butcher, &c.—

Geo. H. Bishop & Co., Cincinnati, O.
John Chatillon & Sons, 85-93 Cliff St., N. Y.
Ferro-Carbon Castings Co., Philadelphia.
C. A. Hoffman, Frankford, Philadelphia.
National Saw Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. & I. J. White Co., Buffalo, N. Y.

CLEAVISES, Malleable—

Kruse Kross Klevis Co., Higginsville, Mo.
Milwaukee Malleable & Gray Iron Works, Milwaukee, Wis.
W. & J. Tiebout, 118 Chambers St., N. Y.

CLINCH RINGS, RIVETS—See Rings, Rivets.**CLIPPERS, Bolt and Rivet—**

Chambers Bros. & Co., Philadelphia, Pa.
Helwig Mfg. Co., St. Paul, Minn.
H. K. Porter, Everett, Mass.
Silver Mfg. Co., Salem, O.

CLIPPERS, Finger Nail—

H. C. Cook & Co., Ansonia, Ct.

CLIPPERS, Horse and Toilet—

American Shearer Mfg. Co., Nashua, N. H.
Brown & Sharpe Mfg. Co., Providence, R. I.
Chicago Flexible Shaft Co., Chicago, Ill.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

CLIPPERS, Stay Bolt—

Helwig Mfg. Co., St. Paul, Minn.

CLIPPING BLADE GRINDERS, Horse—See Grinders, Horse Clipping Blade.**CLIPS, Axle, Spring Bar, &c.—**

Atwater Mfg. Co., Southington, Ct.
E. D. Clapp Mfg. Co., Auburn, N. Y.
Richard Eccles, Auburn, N. Y.
Franklin Moore Co., Winsted, Ct.
Scranton Forging Co., Scranton, Pa.
M. Seward & Son Co., New Haven, Ct.

CLIPS, Bill, Letter, &c., Board—

Globe-Wernicke Co., Cincinnati, O.
J. L. Oefinger, Chicago, Ill.

CLIPS, Carriage Trimmers', &c.—

United States Clothes Pin Co., Montpelier, Vt.

CLIPS, Damper—

Adams Co., Dubuque, Ia.
Berger Brothers Co., Philadelphia, Pa.
Sidney Shepard & Co., Buffalo, N. Y.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Albany, N. Y.

CLIPS, PAPER—See Stationers' Hardware.**CLIPS, Toe—**

Bevin Bros. Mfg. Co., E. Hampton, Ct.
Smith & Egge Mfg. Co., Bridgeport, Ct.
L. T. Snow, New Haven, Ct.

CLIPS, Wire Rope—

A. Leschen & Sons Rope Co., St. Louis, Mo.
Williamsport Wire Rope Co., Williamsport, Pa.

CLOCK BELLS, SPRINGS—See Bells, Springs.**CLOCK ORNAMENTAL BRONZES—See Bronzes, Clock, Ornamental.****CLOCKS—**

Goodwin & Kintz Co., Winsted, Ct.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.

CLOCKS, Marine—

Ashton Valve Co., Boston, Mass.

CLOCKS, Watchman's—

C. Nanz & Co., 127 Duane St., New York.
W. R. Ostrander & Co., 22 Dey St., N. Y.

CLOSET CONNECTIONS—

Randolph-Clowes Co., Waterbury, Ct.

CLOTH DRYERS—See Dryers, Cloth and Cotton.**CLOTH, Emery—**

Baeder, Adamson & Co., Philadelphia, Pa.

CLOTHES BRUSHES—See Brushes, Silver Plated.**CLOTHES DRYERS, HANGERS, &c.—See Dryers, Hangers, &c.****CLOTHES LINE HOLDERS, HOOKS, &c.—See Holders, Hooks, &c.****CLOTH, Window Screen Wire—**

Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 44 Cliff St., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Michigan Wire Cloth Co., Detroit, Mich.
New Jersey Wire Cloth Co., Trenton, N. J.
New York Wire Cloth Co., 102 Chambers St., New York.
I. E. Palmer, Middletown, Ct.
Scheeler's Sons, Buffalo, N. Y.
W. S. Tyler Co., Cleveland, O.
Wickwire Bros., Cortland, N. Y.

CLOTH, Wire (see also Cloth, Window Screen)—

B. T. Barnum, Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Gilbert & Bennett Mfg. Co., 44 Cliff St., New York.
Howard & Morse, 45 Fulton St., N. Y.
Ludlow-Saylor Wire Co., St. Louis, Mo.

Fred. J. Meyers Mfg. Co., Hamilton, O.
Michigan Wire Cloth Co., Detroit, Mich.
New Jersey Wire Cloth Co., Trenton, N. J.
New York Wire Cloth Co., 102 Chambers St., New York.

Scheeler's Sons, Buffalo, N. Y.
W. S. Tyler Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.
Wickwire Bros., Cortland, N. Y.

CLUBS, Golf—

Bridgeport Gun Implement Co., 313 Broadway, New York.

CLUBS, Indian—

John Sommer's Son, Newark, N. J.

CLUTCH COUPLINGS, PULLEY—See Couplings, Pulley.**CLUTCHES, Friction—**

Aultman Co., Canton, O.
E. W. Bliss Co., Brooklyn, N. Y.
Brown Holting & Conveying Machine Co., Cleveland, O.
Geo. V. Cresson Co., Philadelphia, Pa.
Eastern Machinery Co., New Haven, Ct.
Fairmount Machine Co., Philadelphia, Pa.
Heyl & Patterson, Pittsburgh, Pa.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Link-Belt Engineering Co., Philadelphia.
R. Poole & Son Co., Baltimore, Md.

CLUTCHES, Jaw—

Aultman Co., Canton, O.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., New Haven, Ct.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.
R. Poole & Son Co., Baltimore, Md.

CLUTCHES, Wood Split Pulley—

Dodge Mfg. Co., Mishawaka, Ind.

COACH MOUNTINGS, SCREWS—See Mountings, Screws.**COAL—**

Bessemer Coke Co., Pittsburgh, Pa.
Ed. J. Etting, Philadelphia, Pa.
C. B. Houston & Co., Philadelphia, Pa.
Pilling & Crane, Philadelphia, Pa.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
W. H. Thomson & Co., Philadelphia, Pa.
Virginia Iron, Coal & Coke Co., Bristol, Pa.
Washington Coal & Coke Co., Pittsburgh, Pa.
Francis Wister, Philadelphia, Pa.

COAL CARS, HODS, SCALES, &c.—See Cars, Hods, Scales, &c.**COAL CUTTERS—**

General Electric Co., Schenectady, N. Y.
Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
Jeffrey Mfg. Co., Columbus, O.

COAL HANDLING MACHINERY—

Brown Holting & Conveying Machine Co., Cleveland, O.
Buhl Malleable Co., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Thos. Carlin's Sons, Allegheny, Pa.
W. J. Clark Co., Salem, O.
Heyl & Patterson, Pittsburgh, Pa.
C. W. Hunt Co., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.
Williams, White & Co., Moline, Ill.

COAL HOLES—See Iron Work, Builders'.**COALING STATIONS, Locomotive—**

Link-Belt Engineering Co., Philadelphia.
C. W. Hunt Co., West New Brighton, N. Y.

COAL LANDS—

J. H. Hillman & Son, Pittsburgh, Pa.

COAL STOVES—See Stoves, Coal and Wood.**COAL WASHING MACHINERY—**

W. J. Clark Co., Salem, O.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.

COAT HOOKS, RACKS—See Hooks, Racks.**COATING, Rope—**

Ironsides Co., Columbus, O.

COATING, Wire Rope—

Ironsides Co., Columbus, O.

COBBLERS' OUTFITS—Enterprise Mfg. Co., Philadelphia, Pa.
Root Bros. Co., Plymouth, O.
Star Heel Plate Co., Newark, N. J.
Wrightsville Hardware Co., Wrightsville, Pa.**COBBLERS', SHOE NAILS—See Nails, Shoe, Cobblers', Channel, &c.****COCKEYES, SWIVEL—See Eyes, Cock, Swivel.****COCK GRINDERS—See Grinders, Cock—****COCKS, Brass—**Humphries Mfg. Co., Mansfield, O.
McNab & Harlin Mfg. Co., 56 John St., New York.
Nolte Brass Co., Springfield, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.**COCKS, Gauge—**Ashton Valve Co., Boston, Mass.
E. M. Dart, Providence, R. I.
Jenkins Bros., 71 John St., New York.
McNab & Harlin Mfg. Co., 56 John St., New York.**COFFEE MILLS, POT STANDS, ROASTERS—See Mills, Stands, Roasters.****COFFEE POTS—See Pots, Tea and Coffee.****COFFEE SETS—See Sets, Silver Plated.****COFFIN FACTORY MACHINERY—**

J. A. Fay & Co., Cincinnati, O.

COFFIN HARDWARE—

New Britain Hardware Mfg. Co., New Britain, Ct.

COIL CHAIN—See Chain, Coil.**COILERS, Chain Link—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

COILERS, Wire—Garvin Machine Co., Spring and Varick Sts., New York.
E. J. Manville Machine Co., Waterbury, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.**COILING MACHINES, SPRING—See Spring Coiling Machines.****COILS, Pipe—**Harrisburg Pipe Bending Co., Harrisburg, Pa.
McNab & Harlin Mfg. Co., 56 John St., New York.
National Pipe Bending Co., New Haven, Ct.
Whitlock Coil Pipe Co., Elmwood, Ct.**COILS, Ruhm Korff—**

Varley Duplex Magnet Co., Jersey City, N. J.

COINING MACHINERY—E. W. Bliss Co., Brooklyn, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Philadelphia Machine Tool Co., Philadelphia, Pa.**COKE—**C. R. Baird & Co., Philadelphia, Pa.
Bessemer Coke Co., Pittsburgh, Pa.
Reed F. Blair & Co., Pittsburgh, Pa.
H. C. Frick Coke Co., Pittsburgh, Pa.
J. H. Hillman & Son, Pittsburgh, Pa.
C. B. Houston & Co., Philadelphia, Pa.
Jerome Keeley & Co., Philadelphia, Pa.
J. J. Mohr, Philadelphia, Pa.
Pilling & Crane, Philadelphia, Pa.
Poinier & Lester, Toledo, O.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
W. H. Thomson & Co., Philadelphia, Pa.
Virginia Iron, Coal & Coke Co., Bristol, Pa.
Washington Coal & Coke Co., Pittsburgh, Pa.
Francis Wister, Philadelphia, Pa.**COKE, Crushed—**

H. C. Frick Coke Co., Pittsburgh, Pa.

COKE FORKS—See Forks, Coke.**COLD CHISELS—See Chisels, Cold.****COLLAPSIBLE TUBES—See Tubes, Collapsible.****COLLAR SCREWS—See Screws, Collar.****COLLARS, Horse—**

Morley Bros., Saginaw, Mich.

COLLARS, Shafting—Aultman Co., Canton, O.
Buhl Malleable Co., Detroit, Mich.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Jones & Laughlin, Ltd., Pittsburgh, Pa.
Keystone Drop Forge Co., Philadelphia, Pa.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Rhode Island Tool Co., Providence, R. I.
J. H. Williams & Co., Brooklyn, N. Y.**COLLECTING ACCOUNTS—**

Creditors' Legal Union, 302 Broadway, New York.

COLLECTION AGENCIES—

Creditors' Legal Union, 302 Broadway, New York.

COLLECTORS, Dust—American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
New York Blower Co., 39 Cortlandt St., New York.
B. F. Sturtevant Co., Boston, Mass.**COLLECTORS, GRASS—See Catchers, Grass.**

Philadelphia Lawn Mower Co., Philadelphia, Pa.

COLTERS, Plow—

Singer, Nimick & Co., Pittsburgh, Pa.

COLUMNS—See Buildings and Bridges.**COLUMNS, VERANDA—See Iron Work, Builders'.****COMBINATION LOCKS, PLIERS—See Locks, Pliers.****COMBS, Curry—**W. & E. T. Fitch Co., New Haven, Ct.
Imperial Bit & Snap Co., Racine, Wis.
F. E. Kohler & Co., Canton, O.
New York Stamping Co., Brooklyn, N. Y.
Richard Mfg. Co., Bloomington, Pa.
Stover Mfg. Co., Freeport, Ill.**COMBS, Mane and Tail—**

Covert's Saddlery Works, Farmer, N. Y.

COMMERCIAL LITERATURE—See Literature, Commercial.**COMMISSION MERCHANTS, Hardware—See Agents, Hardware Manufacturers'.****COMMUNION SETS—See Sets, Communion, Silver Plated.****COMMUTATOR BARS AND SEGMENTS—See Bars and Segments, Commutator.****COMMUTATOR BRUSH COPPER—See Copper, Commutator Brush.****COMPASSES, DIVIDERS, &c.—**Athol Machine Co., Athol, Mass.
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.**COMPOUND, Graphite Pipe Joint—**

Jos. Dixon Crucible Co., Jersey City, N. J.

COMPOUNDS, Boiler—Exeter Machine Works, Exeter, N. H.
Ironsides Co., Columbus, O.**COMPOUNDS, Case Hardening—See Case Hardening Compounds.****COMPOUNDS for Caulking Pipe Joints—**

Smooth On Mfg. Co., Jersey City, N. J.

COMPOUNDS, Iron—

Smooth On Mfg. Co., Jersey City, N. J.

COMPRESSED AIR MOTORS—See Motors, Compressed Air.**COMPRESSED AIR TOOLS—**Chicago Pneumatic Tool Co., Chicago, Ill.
Chisholm & Moore Mfg. Co., Cleveland, O.
Clayton Air Compressor Works, 36 Cortlandt St., New York.
Thos. H. Dallett & Co., Philadelphia, Pa.
New York Air Compressor Co., 95 Liberty St., New York.
Niles Tool Works Co., Hamilton, O.
Q & C Company, Chicago, Ill.
Philadelphia Pneumatic Tube Co., Philadelphia, Pa.
Standard Pneumatic Tool Co., Chicago, Ill.**COMPRESSION PUMPS—See Pumps, Compression and Vacuum.****COMPRESSORS, Air—**Ed. P. Allis Co., Milwaukee, Wis.
U. Baird Machinery Co., Pittsburgh, Pa.
Bardes Mfg. Co., Mansfield, O.
E. W. Bliss Co., Brooklyn, N. Y.
Braddock Machine & Mfg. Co., Braddock, Pa.
Chicago Pneumatic Tool Co., Chicago, Ill.
Clayton Air Compressor Works, 36 Cortlandt St., New York.
Filer & Stowell Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Gleason-Peters Air Pump Co., Houston & Mercer Sts., New York.
Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
Lane & Bodley Co., Cincinnati, O.
John H. McGowan Co., Cincinnati, O.
New York Air Compressor Co., 95 Liberty St., New York.
Niles Tool Works Co., Hamilton, O.
Northern Engineering Works, Detroit, Mich.
Norwalk Iron Works Co., South Norwalk, Ct.
J. W. Paxson Co., Philadelphia, Pa.
Pedrick & Ayer Co., Philadelphia, Pa.
Rand Drill Co., 100 Broadway, New York.
Frank Toomey, Philadelphia, Pa.**COMPRESSORS, Gas—**Edw. P. Allis Co., Milwaukee, Wis.
Lane & Bodley Co., Cincinnati, O.
Norwalk Iron Works Co., South Norwalk, Ct.
Rand Drill Co., 100 Broadway, New York.**COMPUTING SCALES—See Scales, Computing.****CONDENSERS—**E. P. Allis Co., Milwaukee, Wis.
Filer & Stowell Co., Milwaukee, Wis.
Heat Transmission Co., Danbury, Ct.
F. W. Iredell, 26 Cortlandt St., New York.
Benj. F. Kelley & Son, 91 Liberty St., N. Y.
John H. McGowan Co., Cincinnati, O.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Whitlock Coil Pipe Co., Elmwood, Ct.
R. D. Wood & Co., Philadelphia, Pa.**CONDENSERS, Ammonia—**Harrisburg Pipe Bending Co., Harrisburg, Pa.
York Mfg. Co., York, Pa.**CONDUCTOR ELBOWS, FASTENERS, &c.—See Elbows, Fasteners, &c.****CONDUCTOR PIPE HANGERS—See Hangers, Conductor Pipe.****CONDUCTORS, Pipe—**Berger Bros., Philadelphia, Pa.
Cincinnati Corrugating Co., Piqua, O.
Clark, Quilen & Morse, Peoria, Ill.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Merchant & Co., Philadelphia, Pa.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.**CONE MACHINES, Bicycle—**

Davis & Egan Machine Tool Co., Cincinnati, O.

CONFECTIONERS' COPPER WORK (Steam Jacket Kettle, Revolving Pans, Mixing Machines, Pans, Dropers, Candy Heaters, Batch Warmers, &c.)—

V. Clad & Sons, Philadelphia, Pa.

CONFECTIONERS' HATCHETS—See Hatchets, Confectioners'.**CONNECTING RODS, Locomotive—**

Eastern Forge Co., Boston, Mass.

CONNECTIONS. CLOSET—See Closet Connections.**CONTROLLERS, Electric—**

Electric Controller & Supply Co., Cleveland, O.

CONVERTERS, Bessemer—

Wm. B. Pollock Co., Youngstown, O.
Riter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. Tod & Co., Youngstown, O.

CONVEYING MACHINERY—

Aultman Co., Canton, O.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Buhl Malleable Co., Detroit, Mich.
California Wire Works, San Francisco, Cal.
W. J. Clark Co., Salem, O.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Filer & Stowell Co., Milwaukee, Wis.
Heyl & Patterson, Pittsburgh, Pa.
C. W. Hunt Co., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
Link-Belt Engineering Co., Philadelphia.
R. Poole & Son Co., Baltimore, Md.
Trenton Iron Co., Trenton, N. J.
Wickes Bros., Saginaw, Mich.

CONVEYOR PANS, TROUGHS—See Pans, Troughs.**COOK STOVES—See Stoves, Cook.****COOLERS, Water—**

Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

COOLING TOWERS—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Wm. B. Pollock Co., Youngstown, O.
Southwark Foundry & Machine Co., Philadelphia, Pa.

COOPERS' TOOLS—

L. & I. J. White Co., Buffalo, N. Y.

COOPS, Poultry—

Fred. J. Meyers Mfg. Co., Hamilton, O.

COPING MACHINES, Beam and Channel—

Hilles & Jones Co., Wilmington, Del.

COPING SAWS—See Saws, Coping.**COPPER—**

American Metal Co., 80 Wall St., N. Y.
Ansonia Brass & Copper Co., 19 Cliff St., New York.
John Davol & Sons, 100 John St., N. Y.
Hendricks Bros., 49 Cliff St., New York.
Theo. Hertz & Son, St. Louis, Mo.
Theodore Hofeller & Co., Buffalo, N. Y.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Lewisohn Bros., 81 & 83 Fulton St., N. Y.
Arthur T. Rutter, 256 Broadway, N. Y.
J. J. Ryan & Co., Chicago, Ill.
E. H. Scroud & Co., Chicago, Ill.

COPPER BARS—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
Lewisohn Bros., 81 & 83 Fulton St., N. Y.

COPPER BOILERS, BOTTOMS, &c.—See Boilers, Bottoms, &c.**COPPER, Bolt—**

Ansonia Brass & Copper Co., 19 Cliff St., Bridgeport Brass Co., Bridgeport, Ct.
Hendricks Bros., 49 Cliff St., New York.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Merchant & Co., Philadelphia, Pa.
Randolph-Clowes Co., Waterbury, Ct.
Scovill Mfg. Co., Waterbury, Ct.

COPPER, Commutator Brush—

Ansonia Brass & Copper Co., 19 Cliff St., New York.

COPPER, Cornice—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Randolph-Clowes Co., Waterbury, Ct.

COPPERING—

E. Phillips and Sons, So. Hanover, Mass.

COPPER, Phosphorus—

Crescent Phosphorized Metal Co., Philadelphia, Pa.

COPPER PAILS—See Ware, Copper.**COPPER, Roll and Sheet—**

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Lewisohn Bros., 81 & 83 Fulton St., N. Y.
Merchant & Co., Philadelphia, Pa.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.

COPPERS, Soldering—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
Covert Mfg. Co., W. Troy, N. Y.
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Merchant & Co., Philadelphia, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stover Mfg. Co., Freeport, Ill.
Union Hardware Co., Torrington, Ct.

COPPER WIRE, Bare and Waterproof—See Wires, Electrical.**COPYING PRESSES—See Presses, Copying.****CORD ADJUSTERS, ELECTRIC—See Electric Light Fittings.****CORDAGE—**

American Mfg. Co., 63 Wall St., N. Y.
A. Leschen & Sons' Rope Co., St. Louis, Mo.
Waterbury Rope Co., 69 South St., N. Y.
T. B. Woods' Sons, Chambersburg, Pa.

CORD, Electric—

Ossawan Mills Co., Norwich, Ct.
Samson Cordage Works, Boston, Mass.

CORD GRIPS—See Grips, Cord and Line.**CORD, Picture—**

Ossawan Mills Co., Norwich, Ct.

CORD, Rubber—

Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

CORD, Sash—

American Steel & Wire Co., Chicago, Ill.
John H. Graham & Co., 113 Chambers St., New York.
Ossawan Mills Co., Norwich, Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

CORD, Shade and Ventilator—

Ossawan Mills Co., Norwich, Ct.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

CORDS, Hammock—See Ropes, Hammock and Hitching.**CORD, Signal—**

Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

CORD, Wire, Picture—

Andrew B. Hendryx Co., New Haven, Ct.
Ossawan Mills Co., Norwich, Ct.
Wire Goods Co., Worcester, Mass.

CORD, Wire, Sash—

Ossawan Mills Co., Norwich, Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Williamsport Wire Rope Co., Williamsport, Pa.

CORDAGE MACHINERY—

Hoover & Gamble Co., Miamisburg, O.

CORE COMPOUND—

S. Obermayer Co., Cincinnati, O.
J. W. Paxson Co., Philadelphia, Pa.

CORE MAKING COMPOUND—

Smooth On Mfg. Co., Jersey City, N. J.

CORE OIL—See Oil, Core.**CORK CUTTERS, PRESSES, &c.—See Cutters, Presses, &c.****CORN CRIBS, PORTABLE—See Cribbs, Corn, Portable.****CORN CUTTERS, GRATERS, &c.—See Cutters, Graters, &c.****CORN DRYERS—See Dryers, Corn.****CORNER IRONS, PLATES—See Irons, Plates.****CORNERS, Box—**

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

CORNERS, Trunk—

R. C. Jenkinson & Co., Newark, N. J.

CORNICE COPPER—See Copper, Cornice.**CORNICE, &c., Galvanized Iron—**

G. Drouve Co., Bridgeport, Ct.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.

CORRUGATED ARCHES—See Arches, Curved, Corrugated.**CORRUGATED IRON—**

Berlin Iron Bridge Co., E. Berlin, Ct.
Cincinnati Corrugating Co., Cincinnati, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
W. W. Lindsay & Co., Philadelphia, Pa.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Republic Iron & Steel Co., Chicago, Ill.
Wm. B. Sealie & Sons, Pittsburgh, Pa.
Shiffler Bridge Co., Pittsburgh, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
Alan Wood Co., Arlington, Mass.
Youngstown Iron & Steel Roofing Co., Youngstown, O.

CORRUGATED NAILS—See Nails, Corrugated.**CORRUGATING MACHINERY, SHEET—See Sheet Corrugating Machinery.****CORSET STEEL—See Steel, Corset.****COTTER DRILLS—See Drills, Cotter.****COTTER PIN MACHINERY—**

F. B. Shuster Co., New Haven, Ct.

COTTERS AND KEYS, Spring—

M. S. Brooks & Son, Chester, Ct.
Cobb & Drew, Plymouth, Mass.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Standard Tool Co., Cleveland, O.
Wire Goods Co., Worcester, Mass.

COTTER WIRE—See Wire, Cotter.**COTTON BALE SNIPS—See Snips, Cotton Bale.****COTTON DRYERS—See Dryers, Cloth and Cotton.****COTTON HOOKS, HOSE, ROPE, &c.—See Hooks, Hose, Rope, &c.****COTTON PLANTERS—See Planters, Cotton.****COUCHES AND SOFAS, Office—**

Globe-Wernicke Co., Cincinnati, O.

COUNTER BORERS, SCALES, SUPPORTS—See Borers, Scales, Supports.**COUNTERSHAFTS—**

Bates Machine Co., Joliet, Ill.
Geo. V. Cresson Co., Philadelphia, Pa.
Deming Co., Salem, O.
Diamond Machine Co., Providence, R. I.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.
Garvin Machine Co., Spring & Varick Sts., New York.
Mossberg & Granville Mfg. Co., Providence, R. I.
F. E. Myers & Bro., Ashland, O.
Niles Tool Works Co., Hamilton, O.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
B. F. Sturtevant Co., Boston, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

COUNTERSHAFTS, Variable Speed—

Baker Bros., Toledo, O.

COUNTERSINK BITS—See Bits, Countersink.**COUNTERSINK HEAD NAILS—See Nails, Countersink Head.**

COUNTERSINKING RADIAL MACHINES—

Dietrich & Harvey Machine Co., Baltimore.
Niles Tool Works Co., Hamilton, O.

COUNTERSINKS—

Billings & Spencer Co., Hartford, Ct.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
Butterfield & Co., Derby Line, Vt.
Goodell-Pratt Co., Greenfield, Mass.
H. H. Mayhew Co., Shelburne Falls, Mass.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Norton Mfg. Co., Chester, Ct.
P. W. Perry & Co., Chester, Ct.
Standard Tool Co., Cleveland, O.
Stanley Rule & Level Co., New Britain, Ct.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
Tuck Mfg. Co., Brockton, Mass.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

COUNTERS, Revolution—

Ashton Valve Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston.
W. N. Durant, Milwaukee, Wis.
Harvey Hubbell, Bridgeport, Ct.
Pratt & Whitney Co., Hartford, Ct.
Tabor Mfg. Co., Elizabeth, N. J.

COUNTERS, Store—

J. D. Warren Mfg. Co., Chicago, Ill.

COUNTING MACHINES—

W. N. Durant, Milwaukee, Wis.
Pratt & Whitney Co., Hartford, Ct.

COUPLERS, Steel—

Latrobe Steel Co., Philadelphia, Pa.

COUPLING BOLTS—See Bolts, Special.**COUPLING PINS AND LINKS—See Links and Pins, Car Coupling.****COUPLINGS, Bell Cord—**

American Railway Supply Co., 24 Park Place, New York.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

COUPLINGS, Belt—

Samson Cordage Works, Boston, Mass.

COUPLINGS, Flange—

Aultman Co., Canton, O.
Baker Bros., Toledo, O.
Braddock Machine & Mfg. Co., Braddock, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.
Hess, Snyder & Co., Massillon, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
T. B. Woods' Sons, Chambersburg, Pa.

COUPLINGS, Flexible Shaft—

Thos. H. Dallett & Co., Philadelphia, Pa.

COUPLINGS, Friction Clutch—

E. W. Bliss Co., Brooklyn, N. Y.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., New Haven, Ct.
Fairmount Machine Co., Philadelphia, Pa.
Filler & Stowell Co., Milwaukee, Wis.
Hess, Snyder & Co., Massillon, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
New Haven Mfg. Co., New Haven, Ct.
Robert Poole & Son Co., Baltimore, Md.
T. B. Woods' Sons, Chambersburg, Pa.

COUPLINGS, HOSE—See Hose Attachments.**COUPLINGS, Joint—**

Boston Gear Works, Boston, Mass.
Gould & Eberhardt, Newark, N. J.

COUPLINGS, Pump Rod—

Barnes Mfg. Co., Mansfield, O.
F. E. Myers & Bro., Ashland, O.
Red Jacket Mfg. Co., Davenport, Ia.

COUPLINGS, Shaft—

Edw. P. Allis Co., Milwaukee, Wis.
Aultman Co., Canton, O.
Bates Machine Co., Joliet, Ill.
Braddock Machine & Mfg. Co., Braddock, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Fairbanks Co., 311 Broadway, New York.
Fairmount Machine Co., Philadelphia, Pa.
Filler & Stowell Co., Milwaukee, Wis.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Poole & Sons Co., Baltimore, Md.
Wm. Sellers & Co. (Inc.), Philadelphia.
Geo. B. Sennett Co., Youngstown, O.
T. B. Woods' Sons, Chambersburg, Pa.

COUPLINGS, Universal Joint—

Geo. V. Cresson Co., Philadelphia, Pa.
Fairmount Machine Co., Philadelphia, Pa.
Filler & Stowell Co., Milwaukee, Wis.
Jones & Laughlins, Ltd., Pittsburgh, Pa.

COVERS, Barrel—

Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Scheeler's Sons, Buffalo, N. Y.
Wire Goods Co., Worcester, Mass.
Wright & Colton Cloth Co., Worcester, Mass.

COVERS, Catch Basin—

Vulcan Iron Works, Chicago, Ill.

COVERS, DISH—See Household Articles, Wire.**COVERS, Horse, Truck, &c., Rubber—**

Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

COVERS, Pot—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

COW BELLS—See Bells, Cow.**CRABS, Pole—**

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

CRACKERS, Nut—

Acme Shear Co., Bridgeport, Ct.
American Cutlery Co., Chicago, Ill.
Arcade Mfg. Co., Freeport, Ill.
Bridgeport Mfg. Co., Bridgeport, Ct.
International Silver Co., 9-13 Maiden Lane, New York.
Logan & Strobridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.

CRADLES, Grain—

Iowa Farming Tool Co., Fort Madison, Ia.
Withington & Cooley Mfg. Co., Jackson, Mich.

CRANE CHAIN—See Chain, Crane, Cable, &c.**CRANES, Charging—**

Wm. Sellers & Co. (Inc.), Philadelphia,

CRANES, Dock—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Wm. Sellers & Co. (Inc.), Philadelphia.
Whiting Foundry Equipment Co., Harvey, Ill.

CRANES, Electric—

Alfred Box & Co., Philadelphia, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland, O.
Cleveland Crane & Car Co., Cleveland, O.
Edward J. Etting, Philadelphia, Pa.
Edw. Harrington Son & Co., Philadelphia, Pa.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Morgan Construction Co., Worcester, Mass.
Niles Tool Works Co., Hamilton, O.
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger, Milwaukee, Wis.
Wm. Sellers & Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

CRANES for Riveters—

Bement, Miles & Co., Philadelphia, Pa.

CRANES, Gantry—

Brown Hoisting & Conveying Machine Co., Cleveland, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

CRANES, Hand Power—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Byram & Co., Detroit, Mich.
Chisholm & Moore Mfg. Co., Cleveland, O.
Cleveland Crane & Car Co., Cleveland, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Edward J. Etting, Philadelphia, Pa.
Henry B. Newhall, 26 Cortlandt St., N. Y.

Niles Tool Works Co., Hamilton, O.
Northern Engineering Works, Detroit, Mich.
J. G. Spidel, Reading, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
Whiting Foundry Equipment Co., Harvey, Ill.

CRANES, Hand Traveling—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland, O.
Morgan Construction Co., Worcester, Mass.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

CRANES, Hydraulic—

Frank Kneeland Machine Co., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.
R. D. Wood & Co., Philadelphia, Pa.

CRANES, Hydraulic Jib—

Bement, Miles & Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

CRANES, Jib—

Byram & Co., Detroit, Mich.
Cleveland Crane & Car Co., Cleveland, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Farrel Foundry & Mach. Co., Ansonia, Ct.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Niles Tool Works Co., Hamilton, O.
Northern Engineering Works, Detroit, Mich.
S. Obermayer Co., Cincinnati, O.
J. W. Paxson Co., Philadelphia, Pa.
Craig Ridgway & Son Co., Coatesville, Pa.
Riter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
J. G. Spidel, Reading, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

CRANES, Pneumatic—

Chisholm & Moore Mfg. Co., Cleveland, O.

CRANES, Steam-Hydraulic—

Craig Ridgway & Son Co., Coatesville, Pa.

CRANES, Traveling, Power—

Alfred Box & Co., Philadelphia, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Byram & Co., Detroit, Mich.
Thomas Carlin's Sons, Allegheny, Pa.
Chisholm & Moore Mfg. Co., Cleveland, O.
Cleveland Crane & Car Co., Cleveland, O.
J. Gilmour, Bennett Bldg., New York.
Edwin Harrington, Son & Co., Philadelphia, Pa.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Morgan Construction Co., Worcester, Mass.
Niles Tool Works Co., Hamilton, O.
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger, Milwaukee, Wis.
Pneumatic Crane Co., Pittsburgh, Pa.
Reading Crane & Hoist Works, Reading, Pa.
Craig Ridgway & Son Co., Coatesville, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
J. G. Spidel, Reading, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
Whiting Foundry Equipment Co., Harvey, Ill.
R. D. Wood & Co., Philadelphia, Pa.

CRANES, Wrecking—

Farrel Foundry & Mach. Co., Ansonia, Ct.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

CRANK BORING MACHINES—

Bement, Miles & Co., Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.

CRANK HANGERS, Bicycle—See Bicycle Parts.**CRANK KEY EJECTORS, Bicycle—See Ejectors, Bicycle Crank Key.****CRANK PIN MACHINES—**

Niles Tool Works Co., Hamilton, O.
Pedrick & Ayer Co., Philadelphia, Pa.
Stow Mfg. Co., Binghamton, N. Y.

CRANK PINS, SHAFTS—See Pins, CUPOLAS—

Shafts.

CRANK PLANING MACHINES—Bement, Miles & Co., Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.**CRANKS, Bell—**Norwalk Lock Co., South Norwalk, Ct.
W. R. Ostrander & Co., 22 Dey St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.**CRATE HASPS—See Hasps, Crate.****CREASERS, Blacksmiths'—**

Heller Bros. Co., Newark, N. J.

CREEPERS, Ice—

Gay & Parsons, Augusta, Me.

CRESTING, Galvanized Iron—Wm. Bayley & Sons Co., Milwaukee, Wis.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.**CRESTING, Sheet Iron—**

Kanneberg Roofing Co., Canton, O.

CRIBS, Corn, Portable—

W. J. Adam, Joliet, Ill.

CRIMPING MACHINES—E. W. Bilas Co., Brooklyn, N. Y.
L. S. Heald & Son, Barre, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.**CRIMPING ROLLS—See Rolls, Crimping.****CROCKERY CEMENT—See Cement, Crockery.****CROOKS, Shepherd's—**

Iowa Farming Tool Co., Fort Madison, Ia.

CROQUET SETS—See Sets, Croquet.**CROSSCUT SAWS—See Saws, Mill, Mul- lay, Crosscut, &c.****CROWFEET, Iron—**

I. Spencer's Sons, Guilford, Ct.

CROWNS, Bicycle—See Bicycle Parts.**CRUCIBLES—**Jos. Dixon Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.**CRUMB GATHERERS, KNIVES—See Gatherers, Knives.****CRUSHER PLATES—**

Chrome Steel Works, Brooklyn, N. Y.

CRUSHERS, Ore and Rock—E. P. Allis Co., Milwaukee, Wis.
Thomas Carlin's Sons, Allegheny, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
A. Garrison Foundry Co., Pittsburgh, Pa.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Mesta Machine Co., Pittsburgh, Pa.
Robert Poole & Son Co., Baltimore, Md.
Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.**CUBE HEAD BOLTS—See Bolts, Special.****CULTIVATORS—**Iowa Farming Tool Co., Fort Madison, Ia.
D. B. Smith & Co., Utica, N. Y.
Syracuse Chilled Plow Co., Syracuse, N. Y.
J. K. Wilder & Sons, Monroe, Mich.**CUPBOARD BOLTS, CATCHES, &c.— See Bolts, Catches, &c.****CUP HOOKS—See Hooks, Cup, Shoulder.****CUPOLA LININGS—**J. W. Paxson Co., Philadelphia, Pa.
Chas. Taylor's Sons Co., Cincinnati, O.
M. D. Valentine & Bro. Co., Woodbridge, N. J.
Whiting Foundry Equipment Co., Harvey, Ill.

Byram & Co., Detroit, Mich.

Thos. Carlin's Sons, Allegheny, Pa.
Cleveland Facing Mill Co., Cleveland, O.
Edward J. Etting, Philadelphia, Pa.
Northern Engineering Works, Detroit, Mich.S. Obermayer Co., Cincinnati, O.
J. W. Paxson Co., Philadelphia, Pa.
Wm. B. Pollock Co., Youngstown, O.
Riter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.**CUPS, Aluminum—**

Scovill Mfg. Co., Waterbury, Ct.

CUPS, Children's, Shaving, &c., Silver Plated.International Silver Co., 9-13 Maiden Lane, New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.**CUPS, Grease—**

Lunkenheimer Company, Cincinnati, O.

CUPS, Oil—Chas. H. Besly Co., Chicago, Ill.
Lunkenheimer Company, Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John St., New York.
Pedrick & Ayer Co., Philadelphia, Pa.**CUPS, Pocket—**

Scovill Mfg. Co., Waterbury, Ct.

CUPS, Wax Melting—

Logan & Strobbridge Iron Co., New Brighton, Pa.

CURBS, Well—

William L. Barrett, Bristol, Ct.

CURLED HAIR—See Hair, Curled.**CURLING IRON HEATERS—See Heaters, Curling Iron.****CURLING IRONS—See Irons, Curling.****CURLING SETS—See Sets, Silver Plated.****CURRY COMBS—See Combs, Curry.****CURTAIN AND UPHOLSTERY FIX- TURES—**M. S. Brooks & Son, Chester, Ct.
Ossawan Mills Co., Norwich, Ct.
Stover Mfg. Co., Freeport, Ill.
Wire Goods Co., Worcester, Mass.**CURTAIN RODS—**Ossawan Mills Co., Norwich, Ct.
Wire Goods Co., Worcester, Mass.**CURTAIN STRAPS—See Straps, Cur- tain.****CUSHIONS, Billiard Table—**

Boston Belting Co., Boston, Mass.

CUSPIDORS—Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Ct.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Rome Mfg. Co., Rome, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.**CUT GLASS—See Glass, Cut.****CUTLERY CASES—See Cases, Cutlery.****CUTLERY, Pocket—**Cattaraugus Cutlery Co., Little Valley, N. Y.
John Chatillon & Sons, 85-93 Cliff St., N. Y.
Northfield Knife Co., Northfield, Ct.**CUTLERY, Silver Plated—**

American Cutlery Co., Chicago, Ill.

CUTLERY, Table—American Cutlery Co., Chicago, Ill.
Goodell Co., Antrim, N. H.
Charles Parker Co., Meriden, Ct.**CUT-OFFS—**Berger Bros., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.**CUTTER AND PUNCH, Round Belt—**

Harvey Hubbell, Bridgeport, Ct.

CUTTER, Belt—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

CUTTER GRINDING MACHINES—See Grinding Machines, Cutter and Reamer.**CUTTERS AND LIGHTERS, Cigar—**

Erie Specialty Co., Erie, Pa.

CUTTERS, AUTOMATIC PINION—See Pinion Cutters, Automatic.**CUTTERS, Automatic Rack—**

Gould & Eberhardt, Newark, N. J.

CUTTERS, Axle—Buffalo Forge Co., Buffalo, N. Y.
Butterfield & Co., Derby Line, Vt.**CUTTERS, Bar—**Buffalo Forge Co., Buffalo, N. Y.
C. S. Mersick & Co., New Haven, Ct.**CUTTERS, Board—**

Chambers Bros. Co., Philadelphia, Pa.

CUTTERS, Boiler Tube—Niles Tool Works Co., Hamilton, O.
D. Saunders' Sons, Yonkers, N. Y.
Stow Flexible Shaft Co., Philadelphia, Pa.**CUTTERS, Bolt—**American Tool Works Co., Cleveland, O.
Detrick & Harvey Machine Co., Baltimore, Hill, Clarke & Co., Boston, Mass.
Howard Iron Works, Buffalo, N. Y.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Huschart Machinery Co., Chicago, Ill.
National Machinery Co., Tiffin, O.
New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Wm. Sellers Co. (Inc.), Philadelphia, Pa.
Webster & Perks Tool Co., Springfield, O.
Wells Bros. & Co., Greenfield, Mass.
S. M. York Co., Cleveland, O.**CUTTERS, Button Hole—**Cattaraugus Cutlery Co., Little Valley, N. Y.
R. Heinsch's Sons Co., Newark, N. J.**CUTTERS, Chain Link—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

CUTTERS, Cigar—Billings & Spencer Co., Hartford, Ct.
Erie Specialty Co., Erie, Pa.**CUTTERS, Convex and Concave—**Brown & Sharpe Mfg. Co., Providence, R. I.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.**CUTTERS, Cork—**

Simonds Mfg. Co., Fitchburgh, Mass.

CUTTERS, Feed and Ensilage—Long & Allstatter Co., Hamilton, O.
Orangeville Agricultural Works & Foundry, Orangeville, Pa.
Silver Lake Co., Boston, Mass.
D. B. Smith & Co., Utica, N. Y.
J. K. Wilder & Sons, Monroe, Mich.**CUTTERS, for Miter and Bevel Gears—**Brown & Sharpe Mfg. Co., Providence, R. I.
Gould & Eberhardt, Newark, N. J.**CUTTERS, Gear—See CUTTERS, Milling, and also Gear Cutting Machines.****CUTTERS, Glass—**W. L. Barrett, Bristol, Conn.
H. H. Mayhew Co., Shelburne Falls, Mass.
Mendes Cutting Factories, 14 John St., New York.
Millers Falls Co., 28 Warren St., New York.
S. G. Monce, Unionville, Ct.**CUTTERS, Glass Tube—**

S. G. Monce, Unionville, Ct.

CUTTERS, Gummer—

Butterfield & Co., Derby Line, Vt.

CUTTERS, Key Way—Norton Mfg. Co., Muskegon Heights, Mich.
Whitney Mfg. Co., Hartford, Ct.**CUTTERS, Lace Leather—**Braunsdorf-Mueller Co., Elizabeth, N. J.
Buffalo Specialty Co., Buffalo, N. Y.

CUTTERS, Letter, Steel and Brass—

Schwerdtle & Siebert, Bridgeport, Ct.

CUTTERS, Lock Corner—

Henry Disston & Sons, Philadelphia, Pa.

CUTTERS, Meat and Vegetable—

Athol Machine Co., Athol, Mass.
 Enterprise Mfg. Co., Philadelphia, Pa.
 North Bros. Mfg. Co., Philadelphia, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Silver Lake Co., Boston, Mass.
 S. R. Streeter & Co., Rochester, N. Y.
 O. D. Woodruff, Pottstown, Pa.

CUTTERS, Milling—

Boston Gear Works, Boston, Mass.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Cleveland Twist Drill Co., Cleveland, O.
 Dwight Slate Machine Co., Hartford, Ct.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Gould & Eberhardt, Newark, N. J.
 Geometric Drill Co., Westville, Ct.
 Hill, Clarke & Co., Boston, Mass.
 Ingersoll Milling Machine Co., Rockford, Ill.
 Lucas & Gilem, Philadelphia, Pa.
 Morse Twist Drill & Machine Co., New Bedford, Mass.
 Niles Tool Works Co., Hamilton, O.
 R. D. Nuttall Co., Allegheny, Pa.
 Pratt & Whitney Co., Hartford, Ct.
 Wm. Sellers & Co. (Inc.), Philadelphia.
 Sigourney Tool Co., Hartford, Ct.
 Standard Tool Co., Cleveland, O.
 D. E. Whiton Machine Co., New London, Ct.

CUTTERS, Paper—

Howard Iron Works, Buffalo, N. Y.

CUTTERS, Pipe—

Armstrong Mfg. Co., Bridgeport, Ct.
 Belden Machine Co., New Haven, Ct.
 Bignall & Keeler Mfg. Co., Edwarsville, Ill.
 Curtis & Curtis, Bridgeport, Ct.
 Hollands Mfg. Co., Erie, Pa.
 C. E. Jennings Co., 101 Reade St., N. Y.
 P. Hollingsworth Morris, Philadelphia, Pa.
 National Machine Co., Tiffin, O.
 J. L. Oefinger, Chicago, Ill.
 Pratt & Whitney Co., Hartford, Ct.
 D. Saunders' Sons, Yonkers, N. Y.
 Trimont Mfg. Co., Roxbury, Mass.
 J. H. Williams & Co., Brooklyn, N. Y.

CUTTERS, Potato—

Aspinwall Mfg. Co., Jackson, Mich.

CUTTERS, Reamer and Twist Drill—

Brown & Sharpe Mfg. Co., Providence, R. I.

CUTTERS, Rod—

Belden Machine Co., New Haven, Ct.
 Braunsdorf-Mueller Co., Elizabeth, N. J.
 Chandler & Farquhar, Boston, Mass.
 C. S. Mersick & Co., New Haven, Ct.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Watson-Stillman Co., 204-210 East 43d St., New York.

CUTTERS, Root—

Lane Bros. Co., Poughkeepsie, N. Y.
 R. W. Whitehurst & Co., Norfolk, Va.

CUTTERS, Saw, Kraut, &c.—

Henry Disston & Sons, Philadelphia, Pa.
 Enterprise Mfg. Co., Philadelphia, Pa.
 National Saw Co., Newark, N. J.
 N. R. Streeter & Co., Rochester, N. Y.
 Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

CUTTERS, Smoked Beef—

Enterprise Mfg. Co., Philadelphia, Pa.

CUTTERS, Sprocket Wheel—

Brown & Sharpe Mfg. Co., Providence, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Morse Twist Drill & Mach. Co., New Bedford, Mass.

CUTTERS, Sprue—

E. W. Bliss Co., Brooklyn, N. Y.
 Gould & Eberhardt, Newark, N. J.
 Hilles & Jones Co., Wilmington, Del.
 Long & Allstatler Co., Hamilton, O.
 Niles Tool Works Co., Hamilton, O.
 Northern Engineering Works, Detroit, Mich.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 F. B. Shuster Co., New Haven, Ct.

CUTTERS, Stay Bolt—

Stow Flexible Shaft Co., Philadelphia, Pa.

CUTTERS, Thistle or Weed—

Withington & Cooley Mfg. Co., Jackson, Mich.

CUTTERS, Tobacco—

Erie Specialty Co., Erie, Pa.
 Logan & Strobridge Iron Co., New Brighton, Pa.
 National Specialty Mfg. Co., Philadelphia.
 North Bros. Mfg. Co., Philadelphia, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Wrightsville Hardware Co., Wrightsville, Pa.

CUTTERS, Tobacco and Root—

Enterprise Mfg. Co., Philadelphia, Pa.

CUTTERS, T Slot—

Brown & Sharpe Mfg. Co., Providence, R. I.

CUTTERS, Tube—

Mossberg & Granville Mfg. Co., Providence, R. I.
 Willmot & Hobbs Mfg. Co., Bridgeport, Ct.

CUTTERS, Twine—

T. F. Welch Mfg. Co., Boston, Mass.

CUTTERS, Veneer—

Farrel Foundry & Mach. Co., Ansonia, Ct.

CUTTERS, Washer—

Braunsdorf-Mueller & Co., Elizabeth, N. J.
 Sam'l C. Tatum Co., Cincinnati, O.

CUTTERS, Wire—

Billings & Spencer Co., Hartford, Ct.
 Bridgeport Mfg. Co., Bridgeport, Ct.
 J. M. King & Co., Waterford, N. Y.
 Metropolitan Daylight Lamp Co., Chicago, Ill.
 H. K. Porter, Everett, Mass.
 F. B. Shuster Co., New Haven, Ct.

See also Pliers.

CUTTING AND STRAIGHTENING MACHINES, Wire—See Straightening and Cutting Machines, Wire.**CUTTING ATTACHMENTS, Rack—**

Cincinnati Milling Machine Co., Cincinnati, O.
 Garvin Machine Co., Spring & Varick Sts., New York.

CUTTING DIES, NIPPERS—See Dies, Nippers.**CUTTING MACHINES—**

Automatic Machine Co., Bridgeport, Ct.
 E. J. Manville Machine Co., Waterbury, Ct.

CUTTING MACHINES, Rack—

Dwight Slate Machine Co., Hartford, Ct.
 Niles Tool Works Co., Hamilton, O.

CUTTING MACHINES, Wire—

E. J. Manville Machine Co., Waterbury, Ct.

CUTTING-OFF MACHINES—

Billings & Spencer Co., Hartford, Ct.
 W. P. Davis Machine Co., Rochester, N. Y.
 Hagen & Reid, Troy, N. Y.
 Hill, Clarke & Co., Boston, Mass.
 Hurlbut Rogers Machine Co., South Sudbury, Mass.
 Niles Tool Works Co., Hamilton, O.
 Pratt & Whitney Co., Hartford, Ct.

CUTTING-OFF MACHINES, Cold Saw—

Lucas & Gilem, Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.
 Pratt & Whitney Co., Hartford, Ct.

CUTTING-OFF TOOLS—

Billings & Spencer Co., Hartford, Ct.
 Dwight Slate Machine Co., Hartford, Ct.
 Pratt & Whitney Co., Hartford, Ct.

CUTTING PRESSES—See Presses, Cutting and Finishing.**CYANIDE OF POTASSIUM—**

Talcott, Frisbie & Co., Hartford, Ct.

CYCLES—See Bicycles and Sundries.**CYCLE HANGERS—See Hangers.****CYCLOMETERS—**

Bridgeport Gun Implement Co., 313 Broadway, New York.
 John H. Graham Co., 113 Chambers St., New York.

CYLINDER BORING AND FACING MACHINES—

Niles Tool Works Co., Hamilton, O.
 William Sellers & Co. (Inc.), Philadelphia.
 Stow Flexible Shaft Co., Philadelphia.

CYLINDER HEAD TURNING MACHINES—See Turning Machines, Cylinder Head.**CYLINDERS, Ammonia—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Harrisburg Pipe Bending Co., Harrisburg, Pa.
 Janney, Steinmetz & Co., Philadelphia, Pa.
 National Tube Co., Pittsburgh, Pa.

CYLINDERS, Carbonic Acid—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Harrisburg Pipe Bending Co., Harrisburg, Pa.
 Janney, Steinmetz & Co., Philadelphia, Pa.
 National Tube Co., Pittsburgh, Pa.

CYLINDERS, Pump—See Well Supplies and Tools.**CYLINDERS, Steel—**

Avery Stamping Co., Cleveland, O.
 W. J. Clark Co., Salem, O.
 Janney, Steinmetz & Co., Philadelphia, Pa.
 National Tube Co., Pittsburgh, Pa.

DAMPER CLIPS, REGULATORS—See Clips, Regulators.**DAMPERS, Pipe—**

Adams Co., Dubuque, Ia.
 Arcade Mfg. Co., Freeport, Ill.
 Berger Bros., Philadelphia, Pa.
 Hollands Mfg. Co., Erie, Pa.
 Merchant & Co., Philadelphia, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Sidney Shepard & Co., Buffalo, N. Y.
 Stover Mfg. Co., Freeport, Ill.
 Troy Nickel Works, Albany, N. Y.
 Van Wagoner & Williams Hardware Co., Cleveland, O.
 A. C. Williams, Ravenna, O.

DANDY ROLLS—See Rolls, Dandy.**DASHES AND FENDERS—**

McKinnon Dash Co., Buffalo, N. Y.

DASHES, Screen—

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

DAUBERS, Shoe—

Palmer Hardware Mfg. Co., Troy, N. Y.

DEAD EYES—See Eyes, Dead, Bull's, &c.**DECK BLOCKS, LIGHTS, &c.—See Blocks, Lights, &c.****DECKHANGER BOLTS—See Bolts, Special.****DEHORNING SAWS—See Saws, Dehorning.****DELIVERY WAGONS—See Wagons, Delivery.****DENTAL SHEARS AND SNIPS—See Shears and Snips, Dental.****DENTAL WHEELS—See Wheels, Dental.****DEPTH GAUGES—See Gauges, Depth.****DERRICK FITTINGS—**

Thomas Carlin's Sons, Allegheny, Pa.

DERRICKS—

Thomas Carlin's Sons, Allegheny, Pa.
 F. R. Patch Mfg. Co., Rutland, Vt.
 J. G. Spidel, Reading, Pa.

DESIGNERS—See Engravers and Designers.**DESKS, Children's—**

Maine Mfg. Co., Nashua, N. H.

DESK SLIDES—See Slides, Desk.**DESKS, Office—**

Globe-Wernicke Co., Cincinnati, O.
 J. D. Warren Mfg. Co., Chicago, Ill.

DESK SPECIALTIES, Silver Plated (Inkstands, Calendars, Pen Wipers, Paper Files)—

International Silver Co., 9-13 Maiden Lane, New York.

DIAMOND CUTTERS—

Mendes Cutting Factories, 14 John St., New York.
S. F. Myers & Co., 48 & 50 Maiden Lane, N. Y.

DIAMOND EMERY WHEEL DRESSERS—See Dressers, Emery Wheels.**DIAMONDS, Black—**

Mendes Cutting Factories, 14 John St., New York.

DIAMOND TOOLS—See Tools, Diamond Pointed.**DICTIONARY HOLDERS—See Holders, Dictionary.****DIE BLOCKS—**

Denman & Davis, 5 Cliff St., New York.
Frankfort Steel Co., Ellwood City, Pa.
Wm. M. McFarland, Trenton, N. J.
Morgan Construction Co., Worcester, Mass.
Philadelphia Roll & Machine Co., Philadelphia, Pa.

DIE HEADS, Screw Cutting—

Geometric Drill Co., New Haven, Ct.
Jones & Lamson Machine Co., Springfield, Vt.

DIE HOLDERS, for Screw Machines—

Brown & Sharpe Mfg. Co., Providence, R. I.

DIE HOLDERS, PLATES—See Holders, Plates.**DIE MAKERS—**

American Hardware Mfg. Co., Ottawa, Ill.
Hagen and Reid, Troy, N. Y.
Chas. Leffler & Co., Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Philadelphia Machine Tool Co., Philadelphia, Pa.

DIES, Adjustable Expanding—

E. W. Bliss Co., Brooklyn, N. Y.
W. H. Hibbard, Brooklyn, N. Y.
Pratt & Whitney Co., Hartford, Ct.
E. F. Reece Co., Greenfield, Mass.
D. Saunders' Sons, Yonkers, N. Y.

DIES AND STAMPS, STEEL—See Stamps and Dies, Steel.**DIES AND TAPS—See Stocks, Taps and Dies.****DIES, Automatic—**

E. W. Bliss Co., Brooklyn, N. Y.
Geometric Drill Co., Westville, Ct.
W. H. Hibbard, Brooklyn, N. Y.
Jones & Lamson Machine Co., Springfield, Vt.
Reliance Machine & Tool Co., Cleveland, O.

DIES, Blanking—

Cleveland Stamping & Tool Co., Cleveland.
W. H. Hibbard, Brooklyn, N. Y.
Chas. Leffler & Co., Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Philadelphia Machine Tool Co., Philadelphia, Pa.

DIES, Chilled Cast Wire—

Wm. McFarland, Trenton, N. J.

DIES, Cutting—

Adriance Machine Works, Brooklyn, N. Y.
E. W. Bliss Co., Brooklyn, N. Y.
Cleveland Stamping & Tool Co., Cleveland.
Danielson Machine & Tool Co., Cleveland, O.
Ferracute Machine Co., Bridgeton, N. J.
Hilles & Jones Co., Wilmington, Del.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
Chas. Leffler & Co., Brooklyn, N. Y.
John Loyd, 558 Water St., New York.
Niagara Machine & Tool Works, Buffalo, N. Y.
Pratt & Whitney Co., Hartford, Ct.
Richard Mfg. Co., Bloomsburg, Pa.
Sigourney Tool Co., Hartford, Ct.
L. & I. J. White Co., Buffalo, N. Y.

DIES, Embossing—

E. W. Bliss Co., Brooklyn, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Chas. Leffler & Co., Brooklyn, N. Y.
Geo. M. Ness, Jr., 61 Fulton St., New York.
Schwerdtle & Siebert, Bridgeport, Ct.

DIE SINKERS—

E. W. Bliss Co., Brooklyn, N. Y.
Danielson Machine & Tool Co., Cleveland, O.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
W. H. Hibbard, Brooklyn, N. Y.
Howard Iron Works, Buffalo, N. Y.
Keystone Drop Forge Co., Philadelphia, Pa.
E. Konigslow & Bro., Cleveland, O.
Chas. Leffler & Co., Brooklyn, N. Y.
Pratt & Whitney Co., Hartford, Ct.

Richard Mfg. Co., Bloomsburg, Pa.
Schwerdtle & Siebert, Bridgeport, Ct.
J. H. Williams & Co., Brooklyn, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.
Wilson & Smith, Worcester, Mass.

DIE SINKERS' TOOLS—See Tools, Die Sinkers'.**DIE SINKERS' VISES—See Vises, Die Sinkers'.****DIES, Opening—**

Geometric Drill Co., Westville, Ct.
Pratt & Whitney Co., Hartford, Ct.
Wiler & Russell Mfg. Co., Greenfield, Mass.

DIES, Pressing—

E. W. Bliss Co., Brooklyn, N. Y.
Cleveland Stamping & Tool Co., Cleveland.
Ferracute Machine Co., Bridgeton, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Chas. Leffler & Co., Brooklyn, N. Y.
Philadelphia Machine Tool Co., Philadelphia, Pa.

DIES, Punching—

E. W. Bliss Co., Brooklyn, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
W. H. Hibbard, Brooklyn, N. Y.
E. Konigslow & Bro., Cleveland, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Wilson & Smith, Worcester, Mass.

DIES, Sheet Metal—

Adriance Machine Works, Brooklyn, N. Y.
E. W. Bliss Co., Brooklyn, N. Y.
Danielson Machine & Tool Co., Cleveland, O.
Ferracute Machine Co., Bridgeton, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Hilles & Jones Co., Wilmington, Del.
E. Konigslow & Bro., Cleveland, O.
Chas. Leffler & Co., Brooklyn, N. Y.
Niagara Machine & Tool Co., Buffalo, N. Y.
Philadelphia Machine Tool Co., Philadelphia, Pa.

DIES, Solid Pipe—

D. Saunders' Sons, Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.

DIES, Stamping—

Adriance Machine Works, Brooklyn, N. Y.
Avery Stamping Co., Cleveland, O.
E. W. Bliss Co., Brooklyn, N. Y.
Clark & Cowles, Plainville, Ct.
Cleveland Stamping & Tool Co., Cleveland.
Erdle & Schenck, Rochester, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Hilles & Jones Co., Wilmington, Del.
E. Konigslow & Bro., Cleveland, O.
Chas. Leffler & Co., Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Richard Mfg. Co., Bloomsburg, Pa.
Rudolph & Krummel, Chicago, Ill.
Sigourney Tool Co., Hartford, Ct.
J. H. Williams & Co., Brooklyn, N. Y.
Wilson & Smith, Worcester, Mass.

DIES, Stencil—

L. A. Eucker Stamp Works, Little Ferry, N. J.
Geo. M. Ness, Jr., 61 Fulton St., N. Y.
Schwerdtle & Siebert, Bridgeport, Ct.

DIE STOCKS, Ratchet—

Sandwich Enterprise Co., Sandwich, Ill.

DIES, Welding—

P. F. Burke, Boston, Mass.

DIFFERENTIAL PULLEY BLOCKS—See Blocks, Differential Pulley.**DIGGERS, Post Hole—**

Aspinwall Mfg. Co., Jackson, Mich.
Avery Stamping Co., Cleveland, O.
Henry Diston & Sons, Philadelphia, Pa.
Janesville Hay Tool Co., Janesville, Wis.
F. E. Kohler & Co., Canton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.

DIGGERS, Potato—

Aspinwall Mfg. Co., Jackson, Mich.

DIMENSION GAUGES—See Gauges, Dimension.**DINNER CASTERS—See Casters, Silver Plated.****DINNER PAIRS—See Pails, Dinner.****DISC NOTCHING MACHINES—See Notching Machines, Armature Disc.****DISCS, Armature—**

Avery Stamping Co., Cleveland, O.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
Wilson & Smith, Worcester, Mass.

DISCS, Harrow—

Singer, Nimick & Co., Pittsburgh, Pa.

DISCS, RUBBER—See Washers and Discs, Rubber.**DISCS, Valve—**

Jenkins Bros., 71 John St., New York.

DISH DRAINERS—See Drainers, Kitchen Articles.**DISHERS, Ice Cream—**

V. Clad & Sons, Philadelphia, Pa.
Nelson Lyon, Albany, N. Y.
Seavey Mfg. Co., Boston, Mass.

DISHES, Berry, Butter, Fruit, Meat, &c., Silver Plated.

International Silver Co., 9-13 Maiden Lane, New York.

DISHES, Chafing—

Goodwin & Kintz Co., Winsted, Ct.
International Silver Co., 9-13 Maiden Lane, New York.

DISHES, Soap—

Crescent Brass & Iron Co., Detroit, Mich.
Reading Hardware Co., Reading, Pa.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, N. C.

DITCHING SHOVELS—See Shovels, Tiling or Ditching.**DITCHING TOOLS—**

St. Louis Shovel Co., St. Louis, Mo.

DIVIDER PENCIL ATTACHMENTS—See Pencil Attachments, Divider.**DIVIDERS, COMPASSES, &c.—See Compasses, Dividers, &c.****DIVIDING HEADS—See Heads, Dividing, Indexing.****DOCK SPIKES—See Spikes, Dock, Wharf, &c.****DOCUMENT BOXES—See Boxes, Document.****DOG CALLS, CHAIN—See Calls, Chain.****DOG FURNISHINGS—**

Onelda Community, Niagara Falls, N. Y.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Tower & Lyon, 95 Chambers St., New York.
Union Hardware Co., Torrington, Ct.

DOGS, Clamp—

Billings & Spencer Co., Hartford, Ct.

DOGS, Lathe—

Chas. H. Besly & Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Ct.
Wm. G. Le Count, South Norwalk, Ct.
T. F. Welch Mfg. Co., Boston, Mass.
J. H. Williams & Co., Brooklyn, N. Y.

DOGS, Saw Mill—

E. C. Atkins & Co., Indianapolis, Ind.
Filer & Stowell Co., Milwaukee, Wis.
Wickes Bros., Saginaw, Mich.

DOGS, Timber—

Edw. P. Allis Co., Milwaukee, Wis.
Garland Chain Co., Rankin Station, Pa.
John C. Schmidt & Son, York, Pa.

DOLLIES, Timber—

Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

DOOR BELL HANDLES—See Handles, Door Bell.**DOOR BELLS, BOLTS, CHECKS, &c.—See Bells, Bolts, Checks, &c.****DOORS AND SHUTTERS, Iron and Steel—**

E. T. Barnum, Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Belmont Iron Works, Philadelphia, Pa.
Berlin Iron Bridge Co., East Berlin, Ct.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
New England Structural Co., Boston, Mass.
Henry B. Newhall, 26 Cortlandt St., N. Y.
Stewart Iron Works, Cincinnati, O.
Van Dorn Iron Works Co., Cleveland, O.

DOORS, ASH PIT—See Iron Work, Builders'.**DOORS, Automatic Hatch—**

Morse, Williams & Co., Philadelphia, Pa.

DOORS, Bronze—

Murdock Parlor Grate Co., Boston, Mass.

DOORS, Screen—Edward Darby & Sons, Philadelphia, Pa.
How Wire Works Co., Louisville, Ky.
Scheeler's Sons, Buffalo, N. Y.**DOORS, SCREEN, to order only—**

Phenix Mfg. Co., Milwaukee, Wis.

DORMANT SCALES—See Scales, Dormant.**DOUBLE POINTED TACKS—See Tacks, Double Pointed.****DOUBLERS, Sheet Mill—**J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Wals & Roos Punch & Shear Co., Cincinnati, O.**DOWEL PINS AND SCREWS—See Pins and Screws, Dowel.****DOWELS, Pattern Makers'—**

New Britain Hardware Mfg. Co., New Britain, Ct.

DOWEL TOOLS—See Tools, Dowel, Pin, &c.**DRAFT, Forced, Apparatus—**Buffalo Forge Co., Buffalo, N. Y.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.**DRAFT, Mechanical Plants for—**J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
B. F. Sturtevant Co., Boston, Mass.**DRAFTSMAN'S SCALES—See Scales, Draftsman's.****DRAFT SPRINGS—See Springs, Draft.****DRAG SAWS—See Saws, Mill, Mulay, &c.****DRAGS, Ship—**

Edson Mfg. Co., Boston, Mass.

DRAINERS, Barrel—

National Specialty Mfg. Co., Philadelphia, Pa.

DRAINERS, Dish—

Fred. J. Meyers Mfg. Co., Hamilton, O.

DRAIN SPADES AND CLEANERS—Avery Stamping Co., Cleveland, O.
St. Louis Shovel Co., St. Louis, Mo.**DRAW BENCHES—**Bates Machine Co., Joliet, Ill.
Braddock Machine & Mfg. Co., Braddock, Pa.
G. V. Cresson Co., Philadelphia, Pa.
Gould & Eberhardt, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
Mossberg & Granville Co., Providence, R. I.
Richard Mfg. Co., Bloomsburg, Pa.
Trenton Iron Co., Trenton, N. J.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Watson-Stillman Co., 204 East 43d St., New York.**DRAW BENCHES, Hydraulic—**Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Watson-Stillman Co., 204 East 43d St., New York.**DRAWER HANDLES, KNOBS, PULLS—See Handles, Knobs, Pulls.****DRAWHEADS, Car—**

Atlas Bolt & Screw Co., Cleveland, O.

DRAWING KNIVES, PRESSES—See Knives, Presses.**DRAWING MACHINERY, Wire—See Drawing Benches, Wire.****DREDGES—**

Vulcan Iron Works, Chicago, Ill.

DREDGING MACHINERY—

Geo. V. Cresson Co., Philadelphia, Pa.

DRESSERS, Emery Wheel—American Emery Wheel Works, Boston.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Chicago Screw Co., Chicago, Ill.
Cutter, Wood & Stevens Co., Boston, Mass.
Diamond Machine Co., Providence, R. I.
Thos. L. Dickinson, 45 Vesey St., N. Y.
W. & E. T. Fitch Co., New Haven, Ct.
New Britain Hardware Mfg. Co., New Britain, Ct.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.
Standard Tool Co., Cleveland, O.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Vitrified Wheel Co., Westfield, Mass.**DRESSING, BELT—See Belt Dressing.****DRESSING, Rope—**C. W. Hunt Co., West New Brighton, N. Y.
Ironsides Co., Columbus, O.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Link-Belt Engineering Co., Philadelphia.**DRIED FRUIT AUGERS—See Augers, Dried Fruit.****DRILL AND CLAMP, COMBINED—See Clamp and Drill, Combined.****DRILL, ANVIL AND VISE—See Vise, Drill and Anvil.****DRILL ATTACHMENTS, Vise—**

Prentiss Vise Co., 44 Barclay St., N. Y.

DRILL CASES, CHUCKS, &c.—See Cases, Chucks, &c.**DRILL GRINDING MACHINES, Twist—**Diamond Machine Co., Providence, R. I.
Garvin Machine Co., Spring & Varick Sts., New York.
Niles Tool Works Co., Hamilton, O.
Standard Tool Co., Cleveland, O.**DRILLING AND MILLING MACHINES, BUTT—See Milling and Drilling Machines.****DRILLING AND TAPPING MACHINES—**American Tool Works Co., Cincinnati, O.
Aurora Tool Works, Aurora, Ind.
Bickford Drill & Tool Co., Cincinnati, O.
Baker Bros., Toledo, O.
Garvin Machine Co., Spring & Varick Sts., New York.
Gould & Eberhardt, Newark, N. J.
Lodge & Shipley Machine Tool Co., Cincinnati, O.
Lucas & Glem, Philadelphia, Pa.
C. E. Jennings Co., 101 Rende St., N. Y.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Stow Mfg. Co., Binghamton, N. Y.
Woodward & Rogers, Hartford, Ct.**DRILLING MACHINES—**Aurora Tool Works, Aurora, Ind.
U. Baird Machinery Co., Pittsburgh, Pa.
Baker Bros., Toledo, O.
B. F. Barnes Co., Rockford, Ill.
W. F. & John Barnes Co., Rockford, Ill.
Bates Machine Co., Joliet, Ill.
Baush & Harris Machine Tool Co., Springfield, Mass.
Bement, Miller & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Alfred Box & Co., Philadelphia, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Geo. Burnham Co., Worcester, Mass.
Cincinnati Machine Tool Co., Cincinnati, O.
T. H. Dallett & Co., Philadelphia, Pa.
D'Amour & Littledale Machine Co., 129 Worth St., New York.
W. P. Davis Machine Co., Rochester, N. Y.
Detrick & Harvey Machine Co., Baltimore.
Dwight Slate Machine Co., Hartford, Ct.
Erdle & Schenck, Rochester, N. Y.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
General Electric Co., Schenectady, N. Y.
Geo. Gorton Machine Co., Racine, Wis.
Gould & Eberhardt, Newark, N. J.
E. Harrington, Son & Co., Philadelphia, Pa.
Hill, Clarke & Co., Boston, Mass.
Hilles & Jones Co., Wilmington, Del.
Hofer Mfg. Co., Freeport, Ill.
Lucas & Glem, Philadelphia, Pa.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Husehart Machinery Co., Chicago, Ill.
J. J. McCabe, 14 Dey St., New York.
Millers Falls Co., 28 Warren St., New York.
Mossberg & Granville Mfg. Co., Providence, R. I.New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works Co., Hamilton, O.
Pawling & Harnischfeger, Milwaukee, Wis.
A. B. Pitkin Machinery Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.
Prentice Bros., Worcester, Mass.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
A. D. Quint, Hartford, Ct.
Royersford Foundry & Machine Co., Royersford, Pa.
D. Saunders' Sons, Yonkers, N. Y.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
F. B. Shuster Co., New Haven, Ct.
Sibley & Ware, South Bend, Ind.
Silver Mfg. Co., Salem, O.
Stow Flexible Shaft Co., Philadelphia, Pa.
Frank Toomey, Philadelphia, Pa.
T. F. Welch Mfg. Co., Boston, Mass.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
Woodward & Rogers, Hartford, Ct.
S. W. York Co., Cleveland, O.**DRILLING MACHINES, Bicycle Hub—**

Fox Machine Co., Grand Rapids, Mich.

Pratt & Whitney Co., Hartford, Ct.

DRILLING MACHINES, Bicycle Rim—Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
Pratt & Whitney Co., Hartford, Ct.
Rudolph & Krummel, Chicago, Ill.**DRILLING MACHINES, Connecting Rod—**

Bement, Miles & Co., Philadelphia, Pa.

DRILLING MACHINES, Double Head Traverse—

Pratt & Whitney Co., Hartford, Ct.

DRILLING MACHINES, Gun Barrel—Diamond Machine Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.**DRILLING MACHINES, Spindle—**

Pratt & Whitney Co., Hartford, Ct.

DRILLING MACHINES, Universal, Horizontal—

Detrick & Harvey Machine Co., Baltimore.

DRILLS—See Taps and Drills.**DRILLS, Automatic—**Goodell-Pratt Co., Greenfield, Mass.
Gould & Eberhardt, Newark, N. J.
North Bros. Mfg. Co., Philadelphia, Pa.**DRILLS, Bench—**George Burnham Co., Worcester, Mass.
D'Armour & Littledale Machine Co., 129 Worth St., New York.
Garvin Machine Co., Spring & Varick Sts., New York.
Goodell-Pratt Co., Greenfield, Mass.
Pratt & Whitney Co., Hartford, Ct.
Sigourney Tool Co., Hartford, Ct.**DRILLS, Bicycle—**Baker Bros., Toledo, O.
W. F. & John Barnes Co., Rockford, Ill.
Bickford Drill & Tool Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
Pratt & Whitney Co., Hartford, Ct.**DRILLS, Bit Stock—**Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.**DRILLS, Blacksmith—**Buffalo Forge Co., Buffalo, N. Y.
Geo. Burnham Co., Worcester, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Pratt & Whitney Co., Hartford, Ct.
Wells Bros. & Co., Greenfield, Mass.**DRILLS, Boiler Shell—**American Tool Works Co., Cincinnati, O.
Aurora Tool Works, Aurora, Ind.
Thos. H. Dallett & Co., Philadelphia, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.**DRILLS, Breast—**Bridgeport Mfg. Co., Bridgeport, Ct.
John S. Fray & Co., Bridgeport, Ct.
Goodell-Pratt Co., Greenfield, Mass.
Millers Falls Co., 28 Warren St., New York.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stow Flexible Shaft Co., Philadelphia, Pa.

DRILLS, Brick and Cement—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Steward & Romaine Mfg. Co., Philadelphia.

DRILLS, Clamp—

Geo. Burnham Co., Worcester, Mass.
Chas. G. Eckstein, 249 Centre St., N. Y.
Stow Flexible Shaft Co., Philadelphia, Pa.

DRILLS, Combination Center—

J. T. Slocumb & Co., Providence, R. I.

DRILLS, Cotter—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

DRILLS, Electric—

Thomas H. Dallett & Co., Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Stow Mfg. Co., Binghamton, N. Y.

DRILLS, Flat—

Billings & Spencer Co., Hartford, Ct.

DRILLS, Fluted—

Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

DRILLS, Geared—

Charles Parker Co., Meriden, Ct.

DRILLS, Geometric—

Geometric Drill Co., New Haven, Ct.

DRILLS, Hand—

Thos. H. Dallett & Co., Philadelphia, Pa.
John S. Fray & Co., Bridgeport, Ct.
Goodell-Pratt Co., Greenfield, Mass.
C. E. Jennings Co., 101 Reade St., N. Y.
Millers Falls Co., 28 Warren St., New York.
Niles Tool Works Co., Hamilton, O.
Stow Flexible Shaft Co., Philadelphia, Pa.
Tower & Lyon, 95 Chambers St., N. Y.

DRILLS, Hollow—

Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Machine Co., New Bedford, Mass.

DRILLS, Marble—

F. R. Patch Mfg. Co., Rutland, Vt.

DRILLS, Multiple—

Baker Bros., Toledo, O.
W. F. & John Barnes Co., Rockford, Ill.
Baush & Harris Machine Tool Co., Springfield, Mass.
Bement, Miles & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Geo. Burnham Co., Worcester, Mass.
D'Amour & Littledale Machine Co., 129 Worth St., New York.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
Gould & Eberhardt, Newark, N. J.
E. Harrington, Son & Co., Philadelphia, Pa.
Hill, Clarke & Co., Boston, Mass.
Hoefler Mfg. Co., Freeport, Ill.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Bros., Worcester, Mass.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Sigourney Tool Co., Hartford, Ct.
F. B. Shuster Co., New Haven, Ct.
S. M. York Co., Cleveland, O.

DRILLS, Oil—

Morse Twist Drill & Machine Co., New Bedford, Mass.

DRILL SOCKETS—See Sockets, Drill.**DRILLS, Pneumatic—**

Philadelphia Pneumatic Tool Co., Philadelphia, Pa.
Standard Pneumatic Tool Co., Chicago, Ill.

DRILLS, Portable—

Geo. Burnham Co., Worcester, Mass.
Thos. H. Dallett & Co., Philadelphia, Pa.
Nazel & Bassett, Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Philadelphia Pneumatic Tool Co., Philadelphia, Pa.
Standard Pneumatic Tool Co., Chicago, Ill.
Stow Flexible Shaft Co., Philadelphia, Pa.
Stow Mfg. Co., Binghamton, N. Y.

DRILLS, Post—

E. Harrington, Son & Co., Philadelphia.
Hilles & Jones Co., Wilmington, Del.

DRILLS, Radial—

American Tool Works Co., Cincinnati, O.
Aurora Tool Works, Aurora, Ind.
Baush & Harris Machine Tool Co., Springfield, Mass.
Bement, Miles & Co., Philadelphia, Pa.
Alfred Box & Co., Philadelphia, Pa.
Detrick & Harvey Machine Co., Baltimore.

E. Harrington, Son & Co., Philadelphia.

Hill, Clarke & Co., Boston, Mass.

Hilles & Jones Co., Wilmington, Del.

Manning, Maxwell & Moore, 85 Liberty St., New York.

Niles Tool Works Co., Hamilton, O.

Prentiss Tool & Supply Co., 115 Liberty St., New York.

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.

S. M. York Co., Cleveland, O.

DRILLS, Rail—

Geo. Burnham Co., Worcester, Mass.
Millers Falls Co., 28 Warren St., New York.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.
Stow Mfg. Co., Binghamton, N. Y.

DRILLS, Ratchet—

Bignall & Keeler Mfg. Co., Edwardsville, Ill.
Billings & Spencer Co., Hartford, Ct.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Curtis & Curtis, Bridgeport, Ct.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Millers Falls Co., 28 Warren St., New York.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Charles Parker Co., Meriden, Ct.
Pratt & Whitney Co., Hartford, Ct.

DRILLS, Rock—

E. P. Allis Co., Milwaukee, Wis.
Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
Jeffrey Mfg. Co., Columbus, O.
Keagy & Lear Machine Co., Coshocton, O.
Rand Drill Co., 100 Broadway, New York.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.

DRILLS, Sensitive—

American Tool Works Co., Cincinnati, O.
W. F. & John Barnes Co., Rockford, Ill.
Geo. Burnham Co., Worcester, Mass.
D'Amour & Littledale Machine Co., 129 Worth St., New York.
W. P. Davis Machine Co., Rochester, N. Y.
Dwight Slate Machine Co., Hartford, Ct.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
E. Harrington, Son & Co., Philadelphia.
Hill, Clarke & Co., Wilmington, Del.
Machinists' Supply Co., Rochester, N. Y.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Sigourney Tool Co., Hartford, Ct.
Stow Flexible Shaft Co., Philadelphia, Pa.
Woodward & Rogers, Hartford, Ct.

DRILLS, Suspension—

Bickford Drill & Tool Co., Cincinnati, O.
Niles Tool Works Co., Hamilton, O.
Stow Flexible Shaft Co., Philadelphia, Pa.

DRILLS, Tap—

Aurora Tool Works, Aurora, Ind.
Butterfield & Co., Derby Line, Vt.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.

DRILLS, Tire—

Pleuger & Henger Mfg. Co., St. Louis, Mo.

DRILLS, Turret—

Niles Tool Works Co., Hamilton, O.
A. D. Quint, Hartford, Ct.

DRILLS, Twist—

Cleveland Twist Drill Co., Cleveland, O.
John H. Graham & Co., 113 Chambers St., New York.
H. H. Mayhew Co., Shelburne Falls, Mass.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
J. T. Slocumb & Co., Providence, R. I.
Standard Tool Co., Cleveland, O.

DRILLS, Universal—

Bement, Miles & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Detrick & Harvey Machine Co., Baltimore.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.

DRILLS, Vertical—

Aurora Tool Works, Aurora, Ind.
Cincinnati Macaine Tool Co., Cincinnati, O.
W. P. Davis Machine Co., Rochester, N. Y.
Fox Machine Co., Grand Rapids, Mich.
Gould & Eberhardt, Newark, N. J.
Niles Tool Works Co., Hamilton, O.

DRILLS, Wheel Car—

Niles Tool Works Co., Hamilton, O.

DRILLS, Wood Boring Brace—

Cleveland Twist Drill Co., Cleveland, O.
H. H. Mayhew Co., Shelburne Falls, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland, O.

DRINKING FOUNTAINS—See Fountains, Drinking.**DRINK SHAKERS—See Shakers, Drink.****DRIPPING PANS—See Pans, Dripping.****DRIVE HOOKS, PUNCHES, SCREWS—See Hooks, Punches, Screws.****DRIVERS, Pile—**

Thos. Carlin's Sons, Allegheny, Pa.
Vulcan Iron Works, Chicago, Ill.

DRIVERS, Screw—

Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings & Spencer Co., Hartford, Ct.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Bridgeport Gun Implement Co., 313 Broadway, N. Y.
Bridgeport Mfg. Co., Bridgeport, Ct.
R. H. Brown & Co., New Haven, Ct.
Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
Chantrell Tool Co., Reading, Pa.
Henry Disston & Sons, Philadelphia, Pa.
Goodell-Pratt Co., Greenfield, Mass.
C. J. Kimball Co., Bennington, N. H.
H. H. Mayhew Co., Shelburne Falls, Mass.
New England Specialty Co., North Easton, Mass.
Nicol Mfg. Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Sawyer Tool Co., Fitchburg, Mass.
Snell Mfg. Co., Fiskdale, Mass.
Stanley Rule & Level Co., New Britain, Ct.
L. S. Starrett Co., Athol, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
Tuck Mfg. Co., Brockton, Mass.

DRIVERS, Screw, and Holder—

Tower & Lyon, 95 Chambers St., New York.

DRIVERS, Screw, Automatic—

Goodell-Pratt Co., Greenfield, Mass.
Millers Falls Co., 28 Warren St., New York.
North Bros. Mfg. Co., Philadelphia, Pa.

DRIVERS, Screw, Ratchet—

Gay & Parsons, Augusta, Me.
Millers Falls Co., 28 Warren St., New York.
North Bros. Mfg. Co., Philadelphia, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.

DRIVERS, Screw, Spiral—

C. E. Jennings Co., 101 Reade St., N. Y.
North Bros. Mfg. Co., Philadelphia, Pa.

DRIVERS, Staple—

I. S. Spencer's Sons, Guilford, Ct.

DRUG MILLS—See Mills, Drug.**DRUGS—See Chemicals and Drugs.****DRUMS, Botanizing—**

Sidney Shepard & Co., Buffalo, N. Y.

DRUMS, Friction Winding—

Eastern Machinery Co., New Haven, Ct.

DRYERS, Cloth and Cotton—

American Blower Co., Detroit, Mich.

DRYERS, CLOTHES—

V. Clad & Sons, Philadelphia, Pa.
Hill Dryer Co., Worcester, Mass.

DRYERS, Corn—

Littleford Bros., Cincinnati, O.

DRYERS, Grain—

Pawling & Harnischfeger, Milwaukee, Wis.

DRYING PANS—See Pans, Drying.

DRY KILN APPURTENANCES—

American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
New York Blower Co., 39 Cortlandt St., New York.
B. F. Sturtevant Co., Boston, Mass.

DRY MEASURES—See Measures.**D'S, MALLEABLE—**

Avery Stamping Co., Cleveland, O.

DUMB BELLS, WAITERS—See Bells, Waiters.**DUMB WAITER PULLEYS—See Pulleys.****DUMPING BUCKETS, SELF—See Buckets, Self Dumping.****DUST COLLECTORS, PANS—See Collectors, Pans.****DUSTERS—See Brushes, Whitewash, Horse, &c.****DUSTERS, Turkey, Counter, &c.**
Osborn Mfg. Co., Cleveland, O.**DYEING MACHINES—**

Geo. V. Cresson Co., Philadelphia, Pa.

DYNAMITE—

King Powder Co., Cincinnati, O.

DYNAMOMETERS—

Manning, Maxwell & Moore, 85 Liberty St., New York.

DYNAMOS—

Thos. H. Dallett & Co., Philadelphia, Pa.
Eddy Electric Mfg. Co., Windsor, Ct.
General Electric Co., Schenectady, N. Y.
Hobart Electric Mfg. Co., Troy, O.
Jeffrey Mfg. Co., Columbus, O.
Maxwell M. Mayer Electric Co., 2d Ave. & 121st St., New York.
B. F. Sturtevant Co., Boston, Mass.
Frank Toomey, Philadelphia, Pa.

DYNAMOS, Electro Plating—

Eddy Electric Mfg. Co., Windsor, Ct.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

EARS, Ash Pan, &c.—

Troy Nickel Works, Albany, N. Y.

EARS, Brass Pull—

Bridgeport Brass Co., Bridgeport, Ct.
Waterbury Brass Co., Waterbury, Ct.

EARS, Pull and Tub—

E. H. Titchener & Co., Binghamton, N. Y.

EASELS, WIRE—See Household Articles, Wire.**EAVE TROUGH HANGERS—See Hangers, Eave Trough.****EAVE TROUGHS AND GUTTERS—**

Berger Bros., Philadelphia, Pa.
Clark, Quilen & Morse, Peoria, Ill.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.

EDGERS, Straight—

Athol Machine Co., Athol, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Henry Disston & Sons, Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
Sawyer Tool Co., Fitchburg, Mass.
L. S. Starrett Co., Athol, Mass.

EDGERS, Turf—

Ely Hoe & Fork Co., St. Johnsbury, Vt.
Iowa Farming Tool Co., Fort Madison, Ia.
Jenkins Iron & Tool Co., Howard, Pa.
Withington & Cooley Mfg. Co., Jackson, Mich.

EDGING MACHINES—

Garvin Machine Co., Spring & Varick Sts., New York.
Flier & Stowell Co., Milwaukee, Wis.
Niagara Machine & Tool Works, Buffalo, N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Wickes Bros., Saginaw, Mich.

EGG BEATERS, POACHERS—See Beaters, Poachers.**EGG BOILERS, WIRE—See Kitchen Articles, Wire.****EGG CRATES—See Crates, Egg.****EGG SEPARATORS—See Separators, Egg.****S AND S HOOKS—See Hooks, S and S.****EJECTORS—**

Fairbanks Co., 311 Broadway, New York.
John H. McGowan Co., Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St., New York.
McNab & Harlin Mfg. Co., 56 John St., New York.
N. A. Watson, Erie, Pa.

ELBOW CATCHES—See Catches, Elbow.**ELBOWS AND SHOES, Conductor—**

Clark, Quilen & Morse, Peoria, Ill.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Fred. J. Meyers Mfg. Co., Hamilton, O.

ELBOWS, Pipe Conductor—

Berger Bros., Philadelphia, Pa.
Sidney Shepard & Co., Buffalo, N. Y.

ELBOWS, Stove Pipe—

S. M. Howes Co., Boston, Mass.

ELECTION BOOTHS—See Buildings, Election Booth.**ELECTRICAL ALARMS—See Alarms, Electrical.****ELECTRICAL MACHINES, Dealers in—**
Stewart Electrical Co., Cincinnati, O.**ELECTRICAL REPAIRS—**

Stewart Electrical Co., Cincinnati, O.

ELECTRICAL TROLLEY MATERIALS—See Trolley Materials, Electrical.**ELECTRIC BATTERIES, BELLS, &c.—See Batteries, Bells, &c.****ELECTRIC BELLS—See Bells, Silver Plated.****ELECTRIC BELLS AND SUPPLIES—**
W. R. Ostrander & Co., 22 Dey St., N. Y.**ELECTRIC FITTINGS AND TRIMMINGS—See Gas and Electric Fixture Fittings and Trimmings.****ELECTRIC FIXTURES—See Gas and Electric Fixtures.****ELECTRIC LIGHT FITTINGS (Socket Bushings, Cord Adjusters, Socket Hooks, Lamp Attachments for Gas Fixtures)—**

W. R. Ostrander & Co., 22 Dey St., N. Y.

ELECTRIC LIGHT GUARDS—See Guards, Electric Light.**ELECTRIC PUSH BUTTONS—**

Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

ELECTRIC STORAGE BATTERIES—See Batteries, Electric Storage.**ELECTRIC WOODS—**

Union Hardware Co., Torrington, Ct.

ELECTRO GALVANIZING—

Empire Pipe Bending & Supply Co., Brooklyn, N. Y.

ELECTRO GALVANIZING, Process of—
Blackman & King, 801 Greenwich St., New York.

Empire Pipe Bending & Supply Co., Brooklyn, N. Y.
U. S. Electro-Galvanizing Co., New York.

ELECTRO PLATING BRUSHES, DYNAMOS—See Brushes, Dynamos.**ELECTRO PLATING SUPPLIES—**

Hanson & Van Winkle Co., Newark, N. J.
Hobart Electric Mfg. Co., Troy, O.
Maxwell M. Mayer Electric Co., 2d Ave. & 121st St., New York.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

ELECTRO PLATING TANKS—See Tanks, Electro Plating.**ELECTROTYPE PRESSES—See Presses, Electrotype.****ELECTROTYPE METAL—**

Theo. Hiertz & Son, St. Louis, Mo.
I. Shonberg, 172 Hudson St., New York.

ELECTROTYPING—

A. Mugford, Hartford, Ct.
St. Louis Electrotype Foundry, St. Louis.

ELEVATING MACHINERY—

Aultman Co., Canton, O.
Brown Holsting & Conveying Machine Co., Cleveland, O.
Burk Malleable Co., Detroit, Mich.
Eastern Machinery Co., New Haven, Ct.
Heyl & Patterson, Pittsburgh, Pa.
C. W. Hunt Co., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Lane & Bodley Co., Cincinnati, O.
Link-Belt Engineering Co., Philadelphia.
J. G. Spedel, Reading, Pa.
Storm Mfg. Co., Newark, N. J.
Whiting Foundry & Equipment Co., Harvey, Ill.

ELEVATOR BOLTS, BUCKETS, &c.—See Bolts, Buckets, &c.**ELEVATOR BUCKET PUMPS—See Pumps, Elevator Bucket and Purifying Pumps.****ELEVATOR BUCKETS AND CUPS—See Buckets and Cups, Elevator.****ELEVATOR ENCLOSURES—**

E. T. Barnum, Detroit, Mich.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Edward Darby & Sons, Philadelphia, Pa.
Dow Wire Works Co., Louisville, Ky.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Murdock Parlor Grate Co., Boston, Mass.
National Iron & Wire Co., Cleveland, O.
New England Structural Co., Boston, Mass.
Schaefer's Sons, Buffalo, N. Y.
Stewart Iron Works, Cincinnati, O.
Van Dorn Iron Works Co., Cleveland, O.
Webster & Perks Tool Co., Springfield, O.

ELEVATOR LEGGING HEADS—See Legging Heads, Elevator.**ELEVATORS, Automatic Barrel—**

Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.

ELEVATORS, Belt—

Eastern Machinery Co., New Haven, Ct.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Morse, Williams & Co., Philadelphia, Pa.
Northern Engineering Works, Detroit, Mich.
J. G. Spedel, Reading, Pa.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati, O.

ELEVATORS, Cotton—

B. F. Sturtevant Co., Boston, Mass.

ELEVATORS, Electric—

Louisville Foundry & Machine Co., Louisville, Ky.
Warner Elevator Mfg. Co., Cincinnati, O.

ELEVATORS, Ensilage Cutters—

Silver Mfg. Co., Salem, O.

ELEVATORS, Freight—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Eastern Machinery Co., New Haven, Ct.
Fairmount Machine Co., Philadelphia, Pa.
Franklin Machine Works, St. Paul, Minn.
Howard Iron Works, Buffalo, N. Y.
Lane & Bodley Co., Cincinnati, O.
Louisville Foundry & Machine Co., Louisville, Ky.
Morse, Williams & Co., Philadelphia, Pa.
Northern Engineering Works, Detroit, Mich.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati, O.

ELEVATORS, Grain—

Bicknell Hardware Co., Janesville, Wis.
R. Poole & Son Co., Baltimore, Md.
Riter-Conley Mfg. Co., Pittsburgh, Pa.

ELEVATORS, Hand Power—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Energy Mfg. Co., Philadelphia, Pa.
 Franklin Machine Works, St. Paul, Minn.
 E. Harrington, Son & Co., Philadelphia.
 Louisville Foundry & Machine Co., Louisville, Ky.
 Morse, Williams & Co., Philadelphia, Pa.
 J. G. Speidel, Reading, Pa.
 Storm Mfg. Co., Newark, N. J.
 Variety Machine Co., Warsaw, N. Y.
 Warner Elevator Mfg. Co., Cincinnati, O.

ELEVATORS, Hydraulic—

Frank-Kneeland Machine Co., Pittsburgh.
 Louisville Foundry & Machine Co., Louisville, Ky.
 Warner Elevator Mfg. Co., Cincinnati, O.

ELEVATOR SLIDES, Shapes for—

Finished Steel Co., Youngstown, O.

ELEVATORS, Passenger—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Louisville Foundry & Machine Co., Louisville, Ky.
 Morse, Williams & Co., Philadelphia, Pa.
 National Iron & Wire Co., Cleveland, O.
 Variety Machine Co., Warsaw, N. Y.
 Warner Elevator Mfg. Co., Cincinnati, O.

ELEVATORS, Sidewalk—See Hoists, Sidewalk.**ELEVATORS, Steam-Hydraulic—**

Craig Ridgway & Son Co., Coatesville, Pa.

ELEVATORS, Water—

Buhl Malleable Co., Detroit, Mich.
 Jeffrey Mfg. Co., Columbus, O.
 Link-Belt Engineering Co., Philadelphia.

EMBLEMS, CHARMS, &c.—

S. F. Myers Co., 48-50 Malden Lane, N. Y.

EMBOSSED BRASS—See Brass.**EMBOSSING PUNCHES—See Punches, Embossing.****EMERY—**

American Emery Wheel Works, Providence, R. I.
 Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
 Northampton Emery Wheel Co., Leeds, Mass.
 Star Corundum Wheel Co., Detroit, Mich.
 Tanite Co., Stroudsburg, Pa.
 Vitriified Wheel Co., Westfield, Mass.

EMERY CLOTH—See Cloth.**EMERY GRINDING PANS, STONES, &c.—See Pans, Stones, &c.****EMERY RUBS for Foundry Use—**

American Emery Wheel Works, Providence, R. I.
 Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
 Vitriified Wheel Co., Westfield, Mass.

ENAMELED SIGNS—See Signs, Enamelled.**ENAMELING—**

Avery Stamping Co., Cleveland, O.
 Baltimore Enamel Co., Baltimore, Md.
 Cleveland Stamping & Tool Co., Cleveland.
 John W. Clark, Albany, N. Y.

ENAMELS, Acid Proof and Cast Iron—

Baltimore Enamel Co., Baltimore, Md.

ENCLOSURES, ELEVATOR—See Elevator Enclosures.**END MILLS—See Mills.****ENGINE BELLS, GOVERNORS, &c.—See Bells, Governors, &c.****ENGINEERS, Constructing—**

Edward E. Erikson, Pittsburgh, Pa.
 S. V. Huber & Co., Pittsburgh, Pa.
 Julian Kennedy, Pittsburgh, Pa.
 Walter Kennedy, Pittsburgh, Pa.
 David Lamond, Pittsburgh, Pa.
 Alex. Laughlin & Co., Pittsburgh, Pa.
 W. W. Lindsay & Co., Philadelphia, Pa.
 G. W. McClure & Son, Pittsburgh, Pa.
 Miller Bros. & Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 New England Structural Co., Boston, Mass.
 Northern Engineering Works, Detroit, Mich.
 Passaic Rolling Mill Co., Paterson, N. J.
 Wm. B. Scaffe & Sons, Pittsburgh, Pa.
 S. R. Smythe Co., Pittsburgh, Pa.
 Wm. Swindell & Bro., Pittsburgh, Pa.
 Hugh L. Thompson, Waterbury, Ct.

ENGINEERS, Mechanical—

Henry Aiken, Pittsburgh, Pa.
 S. V. Huber & Co., Pittsburgh, Pa.
 Walter Kennedy, Pittsburgh, Pa.

ENGINEERS, Metallurgical—

Edward E. Erikson, Pittsburgh, Pa.
 S. V. Huber & Co., Pittsburgh, Pa.
 Julian Kennedy, Pittsburgh, Pa.
 Walter Kennedy, Pittsburgh, Pa.
 David Lamond, Pittsburgh, Pa.
 S. R. Smythe Co., Pittsburgh, Pa.
 Hugh L. Thompson, Waterbury, Ct.
 Wellman-Seaver Engineering Co., Cleveland, O.

ENGINES, Air—

American Blower Co., Detroit, Mich.
 E. W. Bliss Co., Brooklyn, N. Y.
 Northern Engineering Works, Detroit, Mich.
 Pedrick & Ayer Co., Philadelphia, Pa.
 Stow Mfg. Co., Binghamton, N. Y.

ENGINES, Blowing—

E. P. Allis Co., Milwaukee, Wis.
 Mesta Machine Co., Pittsburgh, Pa.
 Southwark Foundry & Machine Co., Philadelphia, Pa.
 William Tod & Co., Youngstown, O.

ENGINES, Fire—

Deming Co., Salem, O.

ENGINES, Gas and Gasoline—

Buffalo Forge Co., Buffalo, N. Y.
 Charter Gas Engine Co., Sterling, Ill.
 Daimler Mfg. Co., Long Island City, N. Y.
 Fairbanks Co., 311 Broadway, New York.
 Aug. Mietz, 128-138 Mott St., New York.
 Northern Engineering Works, Detroit, Mich.
 Palmer Bros., Mianus, Ct.
 J. W. Ruger Mfg. Co., Buffalo, N. Y.
 Frank Toomey, Philadelphia, Pa.
 Truscott Boat Mfg. Co., St. Joseph, Mich.
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.
 S. M. York Co., Cleveland, O.

ENGINES, Gas and Gasoline Launch—

Charter Gas Engine Co., Sterling, Ill.

ENGINES, Gas and Gasoline Pumping—

Charter Gas Engine Co., Sterling, Ill.

ENGINES, Hoisting—

E. P. Allis Co., Milwaukee, Wis.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Brown Hoisting & Conveying Machine Co., Cleveland, O.
 Thomas P. Conard, Philadelphia, Pa.
 Filer & Stowell Co., Milwaukee, Wis.
 C. W. Hunt Co., West New Brighton, N. Y.
 F. W. Iredell, 26 Cortlandt St., New York.
 Lane & Bodley Co., Cincinnati, O.
 Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
 Pennsylvania Machinery Co., Philadelphia, Pa.
 Frank Toomey, Philadelphia, Pa.
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.
 S. M. York Co., Cleveland, O.

ENGINES, Kerosene Launch—

Daimler Mfg. Co., Long Island City, N. Y.

ENGINES, Logging—

Thos. Carlin's Sons, Allegheny, Pa.

ENGINES, Oil—

Aultman Co., Canton, O.
 Daimler Mfg. Co., Long Island City, N. Y.
 Aug. Mietz, 128-138 Mott St., New York.

ENGINES, Pumping—

E. P. Allis Co., Milwaukee, Wis.
 E. W. Bliss Co., Brooklyn, N. Y.
 Deming Co., Salem, O.
 Filer & Stowell Co., Milwaukee, Wis.
 Palmer Bros., Mianus, Ct.
 Pennsylvania Machinery Co., Philadelphia, Pa.
 Southwark Foundry & Machine Co., Philadelphia, Pa.

ENGINES, Rolling Mill—

E. P. Allis Co., Milwaukee, Wis.
 F. W. Iredell, 26 Cortlandt St., New York.
 F. R. Phillips' Sons, Philadelphia, Pa.
 Southwark Foundry & Machine Co., Philadelphia, Pa.
 Wm. Tod & Co., Youngstown, O.
 Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.
 Wickes Bros., Saginaw, Mich.
 S. M. York Co., Cleveland, O.

ENGINES, Steam—

E. P. Allis Co., Milwaukee, Wis.
 Aultman Co., Canton, O.
 American Blower Co., Detroit, Mich.
 Bates Machine Co., Joliet, Ill.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Boston Blower Co., Hyde Park, Mass.
 Buffalo Forge Co., Buffalo, N. Y.
 Thos. Carlin's Sons, Allegheny, Pa.
 Exeter Machine Works, Exeter, N. H.
 Filer & Stowell Co., Milwaukee, Wis.
 Howard & Morse, 45 Fulton St., New York.
 F. W. Iredell, 26 Cortlandt St., New York.
 Jeffrey Mfg. Co., Columbus, O.
 Lane & Bodley Co., Cincinnati, O.
 James Leffel & Co., Springfield, O.
 Lovegrove & Co., Philadelphia, Pa.
 F. McSwegan & Sons, 120 Liberty St., N. Y.
 Mesta Machine Co., Pittsburgh, Pa.
 New York Blower Co., 39 Cortlandt St., New York.
 F. R. Patch Mfg. Co., Rutland, Vt.
 Pawling & Harnischfeger, Milwaukee, Wis.
 Pennsylvania Machinery Co., Philadelphia, Pa.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Josiah Ross, Buffalo, N. Y.
 Geo. B. Sennett Co., Youngstown, O.
 Silver Mfg. Co., Salem, O.
 Southwark Foundry & Machine Co., Philadelphia, Pa.
 Stow Flexible Shaft Co., Philadelphia, Pa.
 Stow Mfg. Co., Binghamton, N. Y.
 B. F. Sturtevant Co., Boston, Mass.
 Wm. Tod & Co., Youngstown, O.
 Frank Toomey, Philadelphia, Pa.
 Robt. Wetherill & Co., Chester, Pa.
 W. W. Whitehead, Davenport, Iowa.
 Wickes Bros., Saginaw, Mich.
 S. M. York Co., Cleveland, O.
 York Mfg. Co., York, Pa.

ENGINES, Traction—

O. S. Kelly Co., Springfield, O.

ENGRAVERS AND DESIGNERS—

A. Mugford, Hartford, Ct.

ENGRAVERS' OR SIGN BRASS—See Brass, Sign.**ENGRAVERS' TOOLS—See Tools, Engravers'.****ENGRAVING—**

A. Mugford, Hartford, Ct.
 Schwerdtle & Siebert, Bridgeport, Ct.

ENGRAVING LATHES, ROLL—See Lathes, Roll Engraving.**ENGRAVING MACHINES—**

Geo. Gorton Machine Co., Racine, Wis.

ENGRAVING, PHOTO, Half-tone and Wood—

A. Mugford, Hartford, Ct.

ENSLAGE AND FEED CUTTERS—See Cutters, Feed.**ENSLAGE CUTTER ELEVATORS—See Elevators, Enslage Cutter.****ENVELOPES, Legal—**

Globe-Wernicke Co., Cincinnati, O.

EQUALIZERS, Stave and Bolt—

Peter Gerlach & Co., Cleveland, O.

ERASERS—

Wlebusch & Hilger, Ltd., 9-15 Murray St., New York.

ESCAPES, Fire—

E. T. Barnum, Detroit, Mich.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 J. E. Bolles Iron & Wire Works, Detroit, Mich.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Dow Wire Works Co., Louisville, Ky.
 Ellis & Halfenbarger, Indianapolis, Ind.
 Garry Iron & Steel Roofing Co., Cleveland, O.
 Stewart Iron Works, Cincinnati, O.
 Up-to-Date Mfg. Co., Terre Haute, Ind.
 Van Dorn Iron Works Co., Cleveland, O.

ESUTCHEON PINS—See Pins.**ESUTCHEONS—**

Jos. Bardsley, 147-151 Baxter St., N. Y.
 Norwalk Lock Co., South Norwalk, Ct.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 L. T. Snow, New Haven, Ct.
 Taylor & Boggis Foundry Co., Cleveland, O.
 United States Steel Lock Co., Clinton, Ia.

EXCAVATING MACHINERY—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

EXERCISERS—

Caldwell Mfg. Co., Rochester, N. Y.

EXHAUSTERS—See Fans.**EXHAUSTERS, Gas—**

B. F. Sturtevant Co., Boston, Mass.
Wilbraham Baker Blower Co., Philadelphia, Pa.

EXHAUST HEADS—See Heads, Exhaust.**EXPANDERS, Bicycle—See Bicycle Expanders.****EXPANDERS, Tube—**

Richard Dudgeon, 24 Columbia St., N. Y.
Helwig Mfg. Co., St. Paul, Minn.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Frank Toomey, Philadelphia, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.

EXPANDING DIES, ADJUSTABLE—See Dies, Adjustable Expanding.**EXPANSION AUGERS, BITS, BOLTS—See Augers, Bits, Bolts.****EXPANSION JOINTS—See Joints, Expansion.****EXPORTERS, American Machinery—**

Chas. G. Eckstein & Co., 249 Centre St., New York.

EXTENSION BIT HOLDERS, BRACES, GATES—See Holders, Braces, Gates.**EXTINGUISHERS, Fire—**

Randolph-Clowes Co., Waterbury, Ct.

EXTRACTORS, Juice—

Enterprise Mfg. Co., Philadelphia, Pa.
Logan & Strobbridge Iron Co., New Brighton, Pa.

EXTRACTORS, Spoke—

Defiance Machine Works, Defiance, O.

EYE HOES—See Hoes, Eye.**EYELET MACHINES—**

E. J. Manville Machine Co., Waterbury, Ct.

EYELET PUNCHES—See Punches, Eyelet and Fastener.**EYELETS, Metallic—**

Waterbury Brass Co., Waterbury, Ct.

EYES, Cock—

Atwater Mfg. Co., Southington, Ct.
Covert Mfg. Co., West Troy, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

EYES, Dead, Bull's, &c.—

Boston & Lockport Block Co., Boston.

FACE PLATE JAWS—See Jaws, Face Plate.**FACING MACHINES, Nut—**

Acme Machinery Co., Cleveland, O.
Detrick & Harvey Machine Co., Baltimore.
National Machinery Co., Tiffin, O.
Niles Tool Works Co., Hamilton, O.

FACINGS, Foundry—

Cleveland Facing Mill Co., Cleveland, O.
Jos. Dixon Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.
J. W. Paxton Co., Philadelphia, Pa.
Poinier & Lester, Toledo, O.

FACTORY BUCKETS, TUBS, TANKS—See Buckets, Tubs, Tanks.**FACTORY LOCKERS—See Lockers.****FACTORY VENTILATING—See Ventilating System, Balanced.****FAMILY GRINDSTONES, SCALES—See Grindstones, Scales.****FANCY CHAINS—See Chains, Wagon and Fancy.****FAN MOTORS, ELECTRIC—See Motors, Electric Fan.****FANS—**

American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Concord Axle Co., Penacook, N. H.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Exeter Machine Works, Exeter, N. H.
Howard & Morse, 45 Fulton St., New York.
New York Blower Co., 39 Cortlandt St., New York.
B. F. Perkins & Son, Holyoke, Mass.
B. F. Sturtevant Co., Boston, Mass.
Wilbraham-Baker Blower Co., Philadelphia.

FANS, Electric—

Wm. Bayley & Sons Co., Milwaukee, Wis.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
General Electric Co., Schenectady, N. Y.
B. F. Perkins & Son, Holyoke, Mass.
B. F. Sturtevant Co., Boston, Mass.

FANS, Exhaust—

American Blower Co., Detroit, Mich.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Exeter Machine Works, Exeter, N. H.
New York Blower Co., 39 Cortlandt St., New York.
B. F. Perkins & Son, Holyoke, Mass.

FANS, Fly—

Bridgeport Brass Co., Bridgeport, Ct.

FARM BELLS, SLEDS—See Bells, Sleds.**FARMING MACHINES, Wire—**

Blake & Johnson, Waterbury, Ct.

FARRIERS' KNIVES—See Knives, Farrier.**FASTENER, PUNCHES—See Punches, Eyelet and Fastener.****FASTENERS AND HINGES, BOX—See Hinges and Fasteners.****FASTENERS, Bedstead—**

Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Wrightsville Hardware Co., Wrightsville, Pa.

FASTENERS, Belt—

Billings & Spencer Co., Hartford, Ct.
Bristol Co., Waterbury, Ct.
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Oliver P. Clay Co., Cleveland, O.
Diamond Drill & Machine Co., Birdsboro, Pa.
W. O. Talcott, Providence, R. I.

FASTENERS, Blind—

Charles Parker Co., Meriden, Ct.
Stanley Works, New Britain, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wrightsville Hardware Co., Wrightsville, Pa.

FASTENERS, Box—

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.
Oliver P. Clay Co., Cleveland, O.

FASTENERS, Casement—

Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

FASTENERS, Conductor—

Berger Bros., Philadelphia, Pa.
Clark, Quilen & Morse, Peoria, Ill.
Garry Iron & Steel Roofing Co., Cleveland, O.

FASTENERS, Rope—

W. & E. T. Fitch Co., New Haven, Ct.

FASTENERS, Sash—

Caldwell Mfg. Co., Rochester, N. Y.
Hobart B. Ives & Co., New Haven, Ct.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.

FASTENERS, Screen and Storm Sash—

Phenix Mfg. Co., Milwaukee, Wis.
Stanley Works, New Britain, Ct.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

FASTENERS, Sheet Roofing—

American Steel & Wire Co., Chicago, Ill.

FASTENERS, Shutter—

Norwalk Lock Co., South Norwalk, Ct.

FASTENERS, Tag—

E. H. Titchener & Co., Binghamton, N. Y.

FAUCETS, Bottling—

A. & T. McKenna, Pittsburgh, Pa.

FAUCETS, Brass—

A. & T. McKenna, Pittsburgh, Pa.

FAUCETS, Can—

J. M. Litchfield, 105 Beekman St., N. Y.

FAUCETS, Iron—

Worth Bros. Mfg. Co., Philadelphia, Pa.

FAUCETS, Measuring—

Enterprise Mfg. Co., Philadelphia, Pa.
Lane Bros. Co., Poughkeepsie, N. Y.
National Specialty Mfg. Co., Philadelphia.

FAUCETS, Suction—

Enterprise Mfg. Co., Philadelphia, Pa.

FAUCETS, Wood—

Boston & Lockport Block Co., Boston.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
John Sommer's Son, Newark, N. J.

FEED AND ENSILAGE CUTTERS—See Cutters, Feed.**FEEDER WIRE, Bare and Insulated—See Wires, Electrical.****FEED MANGERS—See Mangers, Feed.****FEED MILLS, PUMPS, BOILER—See Mills, Pumps, Boiler Feed.****FEED WATER HEATERS, PURIFIERS, REGULATORS—See Heaters, Purifiers, Regulators.****FELLOE AND TURNING WEBS—See Webs, Turning, Felloe, &c.****FELLOE PLATES—See Plates, Felloe.****FELTING, Hair—**

Baeder, Adamson & Co., Philadelphia, Pa.

FENCE AND WIRE STRETCHERS—See Stretchers, Fence and Wire.**FENCE MACHINES—**

Sandwich Enterprise Co., Sandwich, Ill.

FENCE POSTS, POST TOPS—See Posts, Post Tops.**FENCE WIRE—See Wire, Iron and Steel, Market, Fence, Stone, &c.****FENCING, GATES, &c.—**

W. J. Adam, Jouet, Ill.
American Steel & Wire Co., Chicago, Ill.
E. T. Barnum, Detroit, Mich.
Belmont Iron Works, Philadelphia, Pa.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Columbus Wire & Iron Works, Columbus, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Edward Darby & Sons, Philadelphia, Pa.
De Kalb Fence Co., De Kalb, Ill.
Dillon-Griswold Wire Co., Sterling, Ill.
Dow Wire Works Co., Louisville, Ky.
Dwiggins Wire Fence Co., Anderson, Ind.
Ellis & Halfenbarger, Indianapolis, Ind.
Frost Wire Fence Co., Cleveland, O.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Hartman Mfg. Co., Ellwood City, Pa.
Hollinger Fence Co., Greenville, O.
Howard & Morse, 45 Fulton St., New York.
Kilmer Wire Mfg. Co., Chicago, Ill.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Michigan Wire Cloth Co., Detroit, Mich.
National Iron & Wire Co., Cleveland, O.
New Jersey Wire Cloth Co., Trenton, N. J.
Scheeler's Sons, Buffalo, N. Y.
Statler-Bischoff Co., Chicago, Ill.
Stewart Iron Works, Cincinnati, O.
Up-to-Date Mfg. Co., Terre Haute, Ind.
Van Dorn Iron Works Co., Cleveland, O.

FENDER NAILS—See Nails, Fender.**FENDERS AND DASHES—See Dashes and Fenders.****FENDERS AND TIPS, RUBBER—See Tips, Fenders, Rubber.**

FENDERS, Carriage—

McKinnon Dash Co., Buffalo, N. Y.

FENDERS, Fire Place—

Edward Darby & Sons, Philadelphia, Pa.
Howard & Morse, 45 Fulton St., New York.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Murdock Parlor Grate Co., Boston, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Scheeler's Sons, Buffalo, N. Y.

FENDERS, Lawn Mower—

Philadelphia Lawn Mower Co., Philadelphia, Pa.

FERRO-ALUMINUM—

Geo. G. Blackwell Sons & Co., Liverpool, England.
J. W. Paxson Co., Philadelphia, Pa.
Pittsburgh Reduction Co., Pittsburgh, Pa.
Willson Aluminum Co., 97 Cedar St., N. Y.

FERRO-CHROME—

Geo. G. Blackwell Sons & Co., Liverpool, England.
Reed F. Blair & Co., Pittsburgh, Pa.
J. W. Paxson Co., Philadelphia, Pa.
Pittsburgh Reduction Co., Pittsburgh, Pa.
Willson Aluminum Co., 97 Cedar St., N. Y.

FERRO-MANGANESE—

Reed F. Blair & Co., Pittsburgh, Pa.
J. W. Paxson Co., Philadelphia, Pa.
J. Wesley Pullman, Philadelphia, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.

FERRO-MOLYBDENUM—

Geo. G. Blackwell Sons & Co., Liverpool, England.
Reed F. Blair & Co., Pittsburgh, Pa.

FERRO-NICKEL—

Geo. G. Blackwell Sons & Co., Liverpool, England.

FERRO-SILICON—

Geo. G. Blackwell Sons & Co., Liverpool, England.
Reed F. Blair & Co., Pittsburgh, Pa.
Willson Aluminum Co., 97 Cedar St., N. Y.

FERRO-SODIUM—

Geo. G. Blackwell Sons & Co., Liverpool, England.

FERRO-TUNGSTEN—

Geo. G. Blackwell Sons & Co., Liverpool, England.
Reed F. Blair & Co., Pittsburgh, Pa.

FERRULES—

Bridgeport Brass Co., Bridgeport, Ct.
Davis & Buxton Stamping Co., Worcester, Mass.
Houghton & Buxton Mfg. Co., Worcester, Mass.
Iowa Farming Tool Co., Fort Madison, Ia.
McNab & Harlin Mfg. Co., 56 John St., New York.
Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.
National Tube Co., Pittsburgh, Pa.
Pratt Chuck Co., Frankfort N. Y.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.
Shelby Steel Tube Co., Cleveland, O.
Union Hardware Co., Torrington, Ct.
Waterbury Brass Co., Waterbury, Ct.
Wilmington & Cooley Mfg. Co., Jackson, Mich.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

FERTILIZER DISTRIBUTERS—

Aspinwall Mfg. Co., Jackson, Mich.

FERTILIZER MACHINERY—

Jeffrey Mfg. Co., Columbus, O.
R. Poole & Son Co., Baltimore, Md.

FIELD HOES—See Hoes, Garden, Field, Mortar.**FIFTH WHEELS—See Wheels, Fifth.****FIGURED BRASS—See Brass.****FIGURES AND LETTERS—See Letters, Figures, &c.****FILE, CHISEL AND AWL HANDLES—See Handles, Chisel, File, Awl, &c.****FILE CLEANERS—See Cleaners, File.****FILE MACHINERY—**

Hess Machine Works, Philadelphia, Pa.

FILERS, Saw—

Nicholson File Co., Providence, R. I.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

FILES AND RASPS—

Arcade File Works, Anderson, Ind.
G. & H. Barnett Co., Philadelphia, Pa.
Henry Disston & Sons, Philadelphia, Pa.
Heller Bros. Co., Newark, N. J.
McCaffrey File Co., Philadelphia, Pa.
National Saw Co., Newark, N. J.
Nicholson File Co., Providence, R. I.
Star Heel Plate Co., Newark, N. J.
Stokes Bros. Mfg. Co., Freehold, N. J.

FILES, Bill, Letter, &c.—

Globe-Wernicke Co., Cincinnati, O.

FILES, Jewelers'—

Nicholson File Co., Providence, R. I.

FILES, Paper—

Arcade Mfg. Co., Freeport, Ill.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Nicol & Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stover Mfg. Co., Freeport, Ill.
Sam'l C. Tatum Co., Cincinnati, O.
Wrightsville Hardware Co., Wrightsville, Pa.

FILES, Planer Knife—

Simonds Mfg. Co., Fitchburg, Mass.

FILING AND INDEXING SYSTEM—

Folding Paper Box Co., South Bend, Ind.

FILING MACHINES, BAND SAW—See Setting and Filing Machines, Band Saw.**FILLERS, Bag—**

John Chatillon & Sons, 85-93 Cliff St., N. Y.

FILLERS, Bottle—

Edson Mfg. Co., Boston, Mass.

FILLERS, Nail Bin—

J. D. Warren Mfg. Co., Chicago, Ill.

FILLERS, Rope—

Ironsides Co., Columbus, Ind.

FILLERS, Wire Rope—

Ironsides Co., Columbus, Ind.

FILTER PAPER—

Elmer & Amend, 205 Third Ave., N. Y.

FILTER PRESSES—See Presses, Filter.**FILTERS, Water—**

Cleveland Stamping & Tool Co., Cleveland.
Wm. B. Sealife & Sons, Pittsburgh, Pa.
N. A. Watson, Erie, Pa.

FINGER BARS, Cold Rolled—

Jones & Laughlins, Ltd., Pittsburgh, Pa.

FINIALS, IRON—See Iron, Ornamental.**FINIALS AND VANES, Sheet Iron—**

G. Drouve Co., Bridgeport, Ct.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.

FINISHING NAILS—See Tacks, Brads, Finishing Nails, &c.**FIREARMS—See Guns, Pistols, Revolvers, &c.****FIRE BACKS—See Stove Repairs, Extension, Grates, Backs, &c.****FIRE BELLS—See Bells, Fire.****FIRE BRICK—See Brick, Fire.****FIRE BRICK, STOVE—See Stove Fire Brick.****FIRE BUCKETS, CLAY, &c.—See Buckets, Clay, &c.****FIREMEN'S TRUMPETS—See Trumpets, Firemen's, Silver Plated.****FIRE PLACE FENDERS—See Fenders, Fire Place.****FIRE PROOF BUILDING MATERIAL—See Building Material, Fire Proof.****FIRE PROOF VAULTS—See Vaults, Fire and Burglar Proof.****FIRE SETS—See Shovels, Tongs, Pokers, Fire Sets, &c.****FISH BASKETS, PLATES, SCALERS, TRAPS—See Baskets, Plates, Scales, Traps.****FISHING REELS—See Reels, Fishing.****FISH STRINGERS—See Stringers, Fish.****FITTINGS, Ammonia—**

Stanley G. Flagg & Co., Philadelphia, Pa.
Indianapolis Drop Forging Co., Indianapolis, Ind.
York Mfg. Co., York, Pa.

FITTINGS, Bicycle—

Davis & Buxton Stamping Co., Worcester, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.

FITTINGS, Flanged—

McNab & Harlin Mfg. Co., 56 John St., New York.
Charles Millar & Son, Utica, N. Y.
United States Cast Iron Pipe & Foundry Co., Philadelphia, Pa.
R. D. Wood & Co., Philadelphia, Pa.

FITTINGS, Furnace—

S. M. Howes Co., Boston, Mass.

FITTINGS, Pipe—

Wm. M. Crane Co., 1131 Broadway, N. Y.
Stanley G. Flagg & Co., Philadelphia, Pa.
Humphreys Mfg. Co., Mansfield, O.
Kennedy Valve Mfg. Co., 58 Beekman St., New York.
Jarecki Mfg. Co., Erie, Pa.
Manning, Maxwell & Moore, 85 Liberty St., New York.
McNab & Harlin Mfg. Co., 56 John St., New York.
Charles Millar & Son, Utica, N. Y.
United States Cast Iron Pipe & Foundry Co., Philadelphia, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.
R. D. Wood & Co., Philadelphia, Pa.

FITTINGS, Steam—

Jarecki Mfg. Co., Erie, Pa.
Lunkenheimer Company, Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John St., New York.
Charles Millar & Son, Utica, N. Y.

FITTINGS, Tramway—

American Steel & Wire Co., Chicago, Ill.

FITTINGS, Wire Rope—

Trenton Iron Co., Trenton, N. J.
Williamsport Wire Rope Co., Williamsport, Pa.

FIVE O'CLOCK TEA KETTLES—See Kettles, Five o'Clock Tea.**FIXTURES, Bathroom—See Bathroom Toilet Specialties.****FIXTURES, GRINDSTONE, STABLE, STORE—See Grindstone, Stable, Store.****FIXTURES, Lightning Rod—**

Cleveland Galvanizing Works, Cleveland.

FLAG POLE SOCKETS—See Sockets, Flag Pole.**FLAGSTAFF HOLDERS—See Holders, Flagstaff.****FLANGE COUPLINGS—See Couplings, Flange.****FLANGES, Steel—**

Latrobe Steel Co., Philadelphia, Pa.

FLANGES, Weldless, Steel—

Latrobe Steel Co., Philadelphia, Pa.

FLANGING CLAMPS—See Clamps, Flanging.**FLASKS, Powder—**

Waterbury Brass Co., Waterbury, Ct.

FLAT LINK CHAINS—See Chains, Flat Link.**FLAT TOP DESKS—See Desks, Roll and Flat Top.****FLOATS, Copper Ball—**

McNab & Harlin Mfg. Co., 56 John St., New York.
Naugatuck Mfg. Co., Naugatuck, Ct.

FLOOR AND BASE KNOBS—See Knobs, Base and Floor.

FLOOR CHISELS—See Chisels, Floor and Ripping.

FLOORING, Bridge—

Belmont Iron Works, Philadelphia, Pa.
Youngstown Iron & Steel Roofing Co.,
Youngstown, O.

FLOORING, Fire Proof—

Youngstown Iron & Steel Roofing Co.,
Youngstown, O.

FLOORING MACHINES—

J. A. Fay & Co., Cincinnati, O.

FLOOR STANDS—See Stands, Floor.

FLOORS, Wire Cloth—

Howard & Morse, 45 Fulton St., New York.
Michigan Wire Cloth Co., Detroit, Mich.

FLORAL DESIGNS—

Fred. J. Meyers Mfg. Co., Hamilton, O.
Wright & Colton Wire Cloth Co., Worcester,
Mass.

FLOUR MILL MACHINERY—

E. P. Allis Co., Milwaukee, Wis.
J. B. & J. M. Cornell, 26th St. & 11th Ave.,
New York.
Robert Poole & Son Co., Baltimore, Md.

**FLOUR SIEVES, SIFTERS, TESTERS—
See Sieves, Sifters, Testers.**

**FLOWER GUARD—See Guards, Flower
and Tomato.**

**FLOWER PICKERS—See Pickers,
Flower and Fruit.**

**FLOWER POT BRACKETS, STANDS—
See Brackets, Stands.**

**FLUE CLEANERS, VENTILATORS—See
Cleaners, Ventilators.**

FLUID FOR BICYCLE TIRES—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

**FLUSH PIPES, RINGS—See Pipes,
Rings.**

FLUTED DRILLS—See Drills, Fluted.

FLUTERS—

North Bros. Mfg. Co., Philadelphia, Pa.
N. R. Streeier & Co., Rochester, N. Y.

FLY FANS, TRAPS—See Fans, Traps,

FLY WHEELS—

Geo. V. Cresson Co., Philadelphia, Pa.
F. W. Iredell, 26 Cortland St., New York.
Robert Poole & Son Co., Baltimore, Md.

**FODDER SHREDDERS, DRY—See
Shredders, Dry Fodder.**

**FOLDING BED HINGES—See Hinges,
Folding Bed.**

**FOLDING CHAIRS—See Chairs, Fold-
ing.**

FOLDING MACHINERY, Paper—

Chambers Bros. Co., Philadelphia, Pa.

FORCEPS, Pig—

J. N. Reimers, Davenport, Ia.

FORCING MACHINES, Hand or Power—
Hill, Clarke & Co., Boston, Mass.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

FORGE BELLS—See Bells, Forge.

**FORGED BOLTS, UNIONS—See Bolts,
Unions.**

FORGES—

Beaudry & Co., Boston, Mass.
Billings & Spencer Co., Hartford, Ct.
Boston Blower Co., Hyde Park, Mass.
Bradley Co., Syracuse, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster,
Pa.
Fairbanks Co., 311 Broadway, New York.
Hill, Clarke & Co., Boston, Mass.
Merrill Bros., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.
Pennsylvania Machinery Co., Philadel-
phia, Pa.
A. B. Pitkin Machinery Co., Providence,
R. I.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Silver Mfg. Co., Salem, O.
B. F. Sturtevant Co., Boston, Mass.
S. M. York Co., Cleveland, O.

FORGING AND BENDING MACHINES—
Niles Tool Works Co., Hamilton, O.

FORGING MACHINES—

Ajax Mfg. Co., Cleveland, O.
Billings & Spencer Co., Hartford, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
A. H. Merriman & Co., Meriden, Ct.
Mossberg & Granville Mfg. Co., Providence,
R. I.

FORGING MACHINES, Bolt—

Acme Machinery Co., Cleveland, O.
Ajax Mfg. Co., Cleveland, O.
Niles Tool Works Co., Hamilton, O.

**FORGING MACHINES, Hand or
Power—**

Williams, White & Co., Moline, Ill.

FORGING MACHINES, Nut—

Niles Tool Works Co., Hamilton, O.

FORGING MACHINES, Sheet Work—

E. W. Bliss Co., Brooklyn, N. Y.

FORGINGS, Bicycle—

Billings & Spencer Co., Hartford, Ct.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
E. D. Clapp Mfg. Co., Auburn, N. Y.
Consolidated Railway Electric Lighting &
Equipment Co., Derby, Ct.
Richard Eccles, Auburn, N. Y.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Keystone Drop Forge Co., Philadelphia, Pa.
Kilborn & Bishop Co., New Haven, Ct.
King Machine Screw Works, New Haven.
M. Seward & Son Co., New Haven, Ct.
Springfield Drop Forging Co., Springfield,
Mass.
Strieby & Foote Co., Newark, N. J.
J. H. Williams & Co., Brooklyn, N. Y.

FORGINGS, Bronze—

Billings & Spencer Co., Hartford, Ct.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Keystone Drop Forge Co., Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Ltd., Phil-
adelphia, Pa.

FORGINGS, Carriage—

Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
E. D. Clapp Mfg. Co., Auburn, N. Y.
Consolidated Railway Electric Lighting &
Equipment Co., Derby, Ct.
Richard Eccles, Auburn, N. Y.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Kilborn & Bishop Co., New Haven, Ct.
Scranton Forging Co., Scranton, Pa.
M. Seward & Son Co., New Haven, Ct.
Strieby & Foote Co., Newark, N. J.

FORGINGS, Copper—

Billings & Spencer Co., Hartford, Ct.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Kilborn & Bishop Co., New Haven, Ct.
Keystone Drop Forge Co., Philadelphia, Pa.
Wyman & Gordon, Worcester, Mass.

FORGINGS, Drop—

Atwater Mfg. Co., Southington, Ct.
J. H. Baker Mfg. Co., Pittsburgh, Pa.
Belden Machine Co., New Haven, Ct.
Billings & Spencer Co., Hartford, Ct.
R. H. Brown & Co., New Haven, Ct.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
E. D. Clapp Mfg. Co., Auburn, N. Y.
Columbus Forge & Iron Co., Columbus, O.
Consolidated Railway Electric Lighting &
Equipment Co., Derby, Ct.
Danleison Machine & Tool Co., Cleve-
land, O.
Denman & Davis, 5 Cliff St., New York.
Richard Eccles, Auburn, N. Y.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Keystone Drop Forge Co., Philadelphia, Pa.
Kilborn & Bishop Co., New Haven, Ct.
Homer F. Livermore, Boston, Mass.
P. Hollingsworth Morris, Philadelphia, Pa.
Norton Mfg. Co., Chester, Ct.
Pratt & Whitney Co., Hartford, Ct.
Phosphor-Bronze Smelting Co., Philadel-
phia, Pa.
Rhode Island Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
M. Seward & Son Co., New Haven, Ct.

Springfield Drop Forging Co., Springfield,
Mass.

Strieby & Foote Co., Newark, N. J.
Transue & Williams, Alliance, O.
Union Hardware Co., Torrington, Ct.
Van Wagoner & Williams Hardware Co.,
Cleveland, O.

Waterbury Farrel Foundry & Machine Co.,
Waterbury, Ct.

J. H. Williams & Co., Brooklyn, N. Y.
Wilson & Smith, Worcester, Mass.
Wyman & Gordon, Worcester, Mass.

FORGINGS, Gun—

Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Kilborn & Bishop Co., New Haven, Ct.

FORGINGS, Handle—

Billings & Spencer Co., Hartford, Ct.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Keystone Drop Forge Co., Philadelphia, Pa.

FORGINGS, Iron, Special—

J. H. Baker Mfg. Co., Pittsburgh, Pa.
Boston & Lockport Block Co., Boston, Mass.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
E. D. Clapp Mfg. Co., Auburn, N. Y.
Keystone Drop Forge Co., Philadelphia, Pa.
Kilborn & Bishop Co., New Haven, Ct.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
P. Hollingsworth Morris, Philadelphia, Pa.
Wheeling Hinge Co., Wheeling, W. Va.

FORGINGS, Manganese Bronze—

W. Cramp & Sons Ship & Engine Building
Co., Philadelphia, Pa.
Keystone Drop Forge Co., Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Ltd., Phil-
adelphia, Pa.
Wyman & Gordon, Worcester, Mass.

**FORGINGS, Marine, Machine, Rail-
road and Shaft—**

Avery Stamping Co., Cleveland, O.
J. H. Baker Mfg. Co., Pittsburgh, Pa.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Bethlehem Iron Co., South Bethlehem, Pa.
Braeburn Steel Co., Braeburn, Pa.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
Cleveland City Forge & Iron Co., Cleveland.
Barclay W. Cotton & Co., Philadelphia, Pa.
Crescent Steel Co., Pittsburgh, Pa.
Denman & Davis, 85 and 87 John St., N. Y.
Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Ellwood City, Pa.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
La Belle Steel Co., Pittsburgh, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
P. Hollingsworth Morris, Philadelphia, Pa.
Janney, Steinmetz & Co., Philadelphia, Pa.
John B. Newkirk & Co., Philadelphia, Pa.
Otis Steel Co., Ltd., Cleveland, O.
Passaic Rolling Mill Co., Paterson, N. J.
Phosphor-Bronze Smelting Co., Philadel-
phia, Pa.
Piersen & Co., 29 Broadway, New York.
Pittsburgh Shear Knife & Machine Co.,
Pittsburgh, Pa.
Port Chester Bolt & Nut Co., Port Chester,
N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Samuel Trethewey & Co., Pittsburgh, Pa.
Vulcan Iron Works, Chicago, Ill.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
West Side Foundry Co., Troy, N. Y.
J. H. Williams & Co., Brooklyn, N. Y.
Wyman & Gordon, Worcester, Mass.

FORGINGS, Steel—

J. H. Baker Mfg. Co., Pittsburgh, Pa.
Chicago Drop Forge & Foundry Co., Ken-
sington, Ill.
Denman & Davis, 85 and 87 John St., N. Y.
Indianapolis Drop Forging Co., Indianapo-
lis, Ind.
Janney, Steinmetz & Co., Philadelphia, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
P. Hollingsworth Morris, Philadelphia, Pa.
F. R. Phillips Sons, Philadelphia, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.

**FORK AND SPADE HANDLES—See
Handles, Fork, Spade, &c.**

**FORK BRACKETS—See Brackets,
Fork.**

**FORKS—See Spoons and Forks, Silver
Plated.**

**FORKS AND SPOONS, IRON—See
Spoons and Forks, Iron.**

FORKS, Barley or Header—

Iowa Farming Tool Co., Fort Madison, Ia.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

FORKS, Coke and Coal—

Iowa Farming Tool Co., Fort Madison, Ia.
Osborn Mfg. Co., Cleveland, O.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

FORKS, Cotton Seed—

Terre Haute Shovel & Tool Co., Terre Haute, Ind.

FORKS, Garden Hand—

Logan & Strobridge Iron Co., New Brighton, Pa.

FORKS, Hay, Horse—See Haying Tools.**FORKS, Hay, Manure, Spading, &c.—**

Ely Hoe & Fork Co., St. Johnsbury, Vt.
Iowa Farming Tool Co., Fort Madison, Ia.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

FORKS, ICE—See Ice Harvesting Tools.**FORKSIDES, Bicycle—See Bicycle Parts.****FORKS, Kitchen—**

H. H. Mayhew & Co., Shelburne Falls, Mass.

FORKS, Scoop, Vegetable—See Scoop Forks, Vegetable.**FORKS, Sluice—**

Terre Haute Shovel & Tool Co., Terre Haute, Ind.

FORKS, SPOONS, &c., SILVER AND SILVER PLATED—See Spoons, Forks, &c., Silver and Silver Plated.**FORKS, Stone or Ballast—**

Terre Haute Shovel & Tool Co., Terre Haute, Ind.

FORKS, Tanners'—

Terre Haute Shovel & Tool Co., Terre Haute, Ind.

FORKS, Wood—

Iowa Farming Tool Co., Fort Madison, Ia.
Withington & Cooley Mfg. Co., Jackson, Mich.

FORMING AND BENDING MACHINES—

Ajax Mfg. Co., Cleveland, O.
Automatic Machine Co., Bridgeport, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Long & Allstatter Co., Hamilton, O.
National Machinery Co., Tiffin, O.
Watson-Stillman Co., 204-210 East 43d St., New York.
Williams, White & Co., Moline, Ill.

FORMING AND BLANKING SHEET METAL—See Blanking and Forming Sheet Metal.**FORMING MACHINES, Automatic—**

E. W. Bliss Co., Brooklyn, N. Y.
Pratt & Whitney Co., Hartford, Ct.

FORMING MACHINES, Sheet Metal—

E. J. Manville Machine Co., Waterbury, Ct.
Niagara Machine & Tool Works, Buffalo, N. Y.
F. B. Shuster Co., New Haven, Ct.

FORMING MACHINES, Wire—

Adrian Machine Works, Brooklyn, N. Y.
Automatic Machine Co., Bridgeport, Ct.
Blake & Johnson, Waterbury, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Cross & Speirs Machine Co., Waterbury, Ct.
Garvin Machine Co., Spring & Varick Sts., New York.
E. J. Manville Machine Co., Waterbury, Ct.
F. B. Shuster Co., New Haven, Ct.
Up-to-Date Mfg. Co., Terre Haute, Ind.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
A. H. Wilson Machine Co., Bridgeport, Ct.

FORMS, Dress and Coat—

Edward Darby & Sons, Philadelphia, Pa.

FOUNDATION AND SEWER GRATINGS—See Gratings, Foundation, Sewer, &c.**FOUNDATION BOLTS—See Bolts, Foundation.****FOUNDRY CARS, FACINGS, &c.—See Cars, Facings, &c.****FOUNDRY PLANTS—**

Byram & Co., Detroit, Mich.
J. Gilmour, Bennett Bldg., New York.
Northern Engineering Works, Detroit, Mich.
S. Obermayer Co., Cincinnati, O.
J. W. Paxson Co., Philadelphia, Pa.
Pennsylvania Engineering Works, New Castle, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

FOUNDRY SUPPLIES—

Brown & Sharpe Mfg. Co., Providence, R. I.
Cleveland Facing Mill Co., Cleveland, O.
Justice Cox, Jr., Philadelphia, Pa.
Edward J. Etting, Philadelphia, Pa.
J. Gilmour, Bennett Bldg., New York.
Gould & Eberhardt, Newark, N. J.
Maywood Foundry & Machine Co., Chicago, Ill.
Northern Engineering Works, Detroit, Mich.
S. Obermayer Co., Cincinnati, O.
Osborn Mfg. Co., Cleveland, O.
J. W. Paxson Co., Philadelphia, Pa.
Pennsylvania Engineering Works, New Castle, Pa.
Poinier & Lester, Toledo, O.
Smooth-On Mfg. Co., Jersey City, N. J.
Chas. Taylor's Sons Co., Cincinnati, O.
Whiting Foundry Equipment Co., Harvey, Ill.

FOUNTAIN PENS—See Pens, Fountain.**FOUNTAINS, Drinking—**

Pleuger & Henger Mfg. Co., St. Louis, Mo.

FOUNTAINS, Park, Lawn, &c.—

F. E. Kohler & Co., Canton, O.
Stewart Iron Works, Cincinnati, O.

FRAMES AND SUMMER FRONTS, GRATE—See Grate Frames and Summer Fronts.**FRAMES, Bag—**

R. C. Jenkinson & Co., Newark, N. J.

FRAMES, Binder—

Jones & Laughlins, Ltd., Pittsburgh, Pa.

FRAMES, Bracket Saw—

Millers Falls Co., 28 Warren St., New York.

FRAMES, Card, Drawer—

Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

FRAMES, Door and Window Screen—

Maine Mfg. Co., Nashua, N. H.

FRAME SETTERS—See Setters, Frame or Angle.**FRAMES, Grindstone—**

Athol Machine Co., Athol, Mass.
Garvin Machine Co., Spring & Varick Sts., New York.

FRAMES, Hack Saw—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Henry Disston & Sons, Philadelphia, Pa.
Millers Falls Co., 28 Warren St., New York.
L. S. Starrett Co., Athol, Mass.
Union Hardware Co., Torrington, Ct.

FRAMES, Locomotive—

Eastern Forge Co., Boston, Mass.

FRAMES, Mirror and Photograph Brass—

Crescent Brass & Iron Co., Detroit, Mich.

FRAMES, Photograph, Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.
S. F. Myers & Co., 48-50 Malden Lane, N. Y.

FRAMES, Wire Galvanizing—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

FRAMES, Wire Tinning—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

FRAMES, Wood Saw—

National Saw Co., Newark, N. J.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

FREEZERS, Ice Cream—

V. Clad & Sons, Philadelphia, Pa.
North Bros. Mfg. Co., Philadelphia, Pa.
Sidney Shepard & Co., Buffalo, N. Y.
Sam'l C. Tatum Co., Cincinnati, O.
White Mountain Freezer Co., Nashua, N. H.

FREIGHTING OUTFITS, Overland—

O. S. Kelly Co., Springfield, O.

FROGS, RAILROAD—See Switches and Frogs, Railroad.**FRONTS, BUILDING, Sheet Iron—**

Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.

FRUIT BOWLS—See Bowls, Silver Plated.**FRUIT CAN WAX—See Wax Fruit Can.****FRUIT DISHES—See Dishes, Silver Plated.****FRUIT GATHERING SHEARS—See Shears, Fruit and Flower Gathering.****FRY PANS—See Pans, Fry.****FUEL OIL BURNING APPLIANCES—**

W. S. Rockwell & Co., Havemeyer Bldg., New York.

FULLER BALLS, RUBBER—See Balls, Fuller, Rubber.**FUNNELS, Charging—**

W. J. Clark Co., Salem, O.

FURNACE CHARGING SCALES, LAMPS—See Scales, Lamps.**FURNACES, Annealing—**

Brown & Sharpe Mfg. Co., Providence, R. I.
Edward E. Erikson, Pittsburgh, Pa.
Miller Bros. & Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
J. W. Paxson Co., Philadelphia, Pa.
W. S. Rockwell & Co., Havemeyer Bldg., New York.
Wm. Swindell & Bros., Pittsburgh, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Whiting Foundry Equipment Co., Harvey, Ill.

FURNACES, Annealing Lead—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

FURNACES, Blast—

Edward E. Erikson, Pittsburgh, Pa.
S. V. Huber & Co., Pittsburgh, Pa.
Julian Kennedy, Philadelphia, Pa.
Walter Kennedy, Pittsburgh, Pa.
David Lamond, Pittsburgh, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
G. W. McClure & Son, Pittsburgh, Pa.

FURNACES, Brand Heating—

Littleford Bros., Cincinnati, O.

FURNACES, Brass Melting—

Byram & Co., Detroit, Mich.
J. W. Paxson Co., Philadelphia, Pa.
W. S. Rockwell & Co., Havemeyer Bldg., New York.
Wm. Swindell & Bros., Pittsburgh, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

FURNACES, Brazing—

W. S. Rockwell & Co., Havemeyer Bldg., New York.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

FURNACES, Case Hardening—

Brown & Sharpe Mfg. Co., Providence, R. I.
W. S. Rockwell & Co., Havemeyer Bldg., New York.

FURNACES, Chain Heating—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

FURNACES, Corrugated Boiler—

Barclay W. Cotton & Co., Philadelphia, Pa.

FURNACES, Crucible—

Alex. Laughlin & Co., Pittsburgh, Pa.
J. W. Paxson Co., Philadelphia, Pa.
Wm. Swindell & Bros., Pittsburgh, Pa.

FURNACES, Forging—

Billings & Spencer Co., Hartford, Ct.
W. S. Rockwell & Co., Havemeyer Bldg., New York.

FURNACES, Gas Blast—

Chicago Flexible Shaft Co., Chicago, Ill.

FURNACES, Heating—

Edward E. Erikson, Pittsburgh, Pa.
S. V. Huber & Co., Pittsburgh, Pa.
Julian Kennedy, Pittsburgh, Pa.
Alex. Laughlin & Co., Pittsburgh, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
G. W. McClure & Son, Pittsburgh, Pa.
Miller Bros. & Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
W. S. Rockwell & Co., Havemeyer Bldg., New York.
S. R. Smythe Co., Pittsburgh, Pa.
Wm. Swindell & Bros., Pittsburgh, Pa.
Wellman-Seaver Engineering Co., Cleveland, O.

FURNACE SHOVELS—See Shovels and Scoops, Furnace.**FURNACES, Muffle and Crucible—**

Elmer & Amend, 205 3d Ave., New York.

FURNACES, Open Hearth—

Edward E. Erikson, Pittsburgh, Pa.
S. V. Huber & Co., Pittsburgh, Pa.
Julian Kennedy, Pittsburgh, Pa.
Walter Kennedy, Pittsburgh, Pa.
Alex. Laughlin & Co., Pittsburgh, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
G. W. McClure & Son, Pittsburgh, Pa.
Miller Bros. & Co., Pittsburgh, Pa.
J. W. Paxson Co., Philadelphia, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Wm. B. Pollock Co., Youngstown, O.
Riter-Conley Mfg. Co., Pittsburgh, Pa.
S. R. Smythe Co., Pittsburgh, Pa.
Wm. Swindell & Bros., Pittsburgh, Pa.
Wellman-Seaver Engineering Co., Cleveland, O.

FURNACES, Plumbers' and Tinnerns—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Schneider & Trenkamp Co., Cleveland, O.

FURNACES, Portable, Lead, Gravel, Tar, &c.—

Littleford Bros., Cincinnati, O.

FURNACES, Puddling—

Alex. Laughlin & Co., Pittsburgh, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Wm. Swindell & Bros., Pittsburgh, Pa.

FURNACES, Roasting, Ore—

E. P. Allis Co., Milwaukee, Wis.

FURNACES, Soldering—

Garry Iron & Steel Roofing Co., Cleveland, O.

FURNACES, Tube Welding—

Alex. Laughlin & Co., Pittsburgh, Pa.
Miller Bros. & Co., Pittsburgh, Pa.

FURNACES, Warm Air—

Hess, Snyder & Co., Massillon, O.

FURNACES, Wire Galvanizing—

W. S. Rockwell & Co., Havemeyer Bldg., New York.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

FURNACES, Wire Tinning—

W. S. Rockwell & Co., Havemeyer Bldg., New York.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

FURNITURE MACHINERY—

Egan Co., Cincinnati, O.

FURNITURE TRIMMINGS—See Trimmings, Furniture.**FUSE—**

Ensign Bickford & Co., Simsbury, Ct.
King Powder Co., Cincinnati, O.

GADDERS—

Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
F. R. Patch Mfg. Co., Rutland, Vt.
Rand Drill Co., 100 Broadway, New York.

GALLEY SHEETS—See Sheets, Galley.**GALVANIZED BOLTS—See Bolts, Galvanized.****GALVANIZED IRON CORNICE, &c.—See Cornice, &c., Galvanized Iron.****GALVANIZED SHEETS—See Sheets, Galvanized.****GALVANIZED SHEETS, Corrugated, Plain and Painted—**

American Sheet Steel Co., Battery Park Building, New York.

GALVANIZING—

Avery Stamping Co., Cleveland, O.
Cleveland Galvanizing Works, Cleveland, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Wm. B. Sealife & Sons, Pittsburgh, Pa.
Sidney Shepard & Co., Buffalo, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.

GALVANIZING MACHINERY, Wire—

Bates Machine Co., Joliet, Ill.
Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

GALVANIZING PLANTS—

Braddock Machine & Mfg. Co., Braddock, Pa.
U. S. Electro-Galvanizing Co., 348 Broadway, New York.
Wm. B. Pollock Co., Youngstown, O.

GALVANIZING, Process of—

Blackman & King, 801 Greenwich St., New York.
S. V. Huber & Co., Pittsburgh, Pa.
U. S. Electro-Galvanizing Co., 348 Broadway, New York.

GALVANIZED WIRE STRAND—See Wires, Electrical.**GAME BAGS, TRAPS—See Bags, Traps.****GANG SAWS—See Saws, Gang.****GARBAGE CANS—See Cans, Ash and Garbage.****GARBAGE CHUTES—See Chutes, Garbage.****GARDEN HAND FORKS—See Forks, Garden Hand.****GARDEN HOES—See Hoes, Garden, Field, Mortar, &c.****GARDEN LINES, RAKES, &c.—See Lines, Rakes, &c.****GARDEN SHEARS—See Shears, Garden.****GARMENT DISPLAY STANDS, HOOKS AND EYES, STAND BASES—See Stands, Hooks and Eyes, Bases.****GARNET PAPER—See Papers, Sand, Garnet, &c.****GAS ATTACHMENTS—**

I. S. Spencer's Sons, Guilford, Ct.

GAS AND ELECTRIC FIXTURES—

Bridgeport Brass Co., Bridgeport, Ct.
J. L. Oefinger, Chicago, Ill.

GAS FILTERS—See Filters, Gas.**GASOLINE VAPOR LAMPS—See Lamps, Gasoline, Gas.****GASKETS AND RINGS, Rubber—**

Boston Belting Co., Boston, Mass.
H. O. Canfield, Bridgeport, Ct.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

GASKETS, Corrugated Copper—

Taunton Locomotive Mfg. Co., Taunton Mass.

GASOLINE ENGINES, GENERATORS, &c.—See Engines, Generators, &c.**GASOLINE GAS LAMPS—See Lamps.****GAS PLANT MACHINERY—**

J. B. & J. M. Cornell, 26th St., & 11th Ave., New York.
Wm. B. Pollock Co., Youngstown, O.
Riter-Conley Mfg. Co., Pittsburgh, Pa.
R. D. Wood & Co., Detroit, Mich.

GAS PORTABLES—

Goodwin & Kintz Co., Winsted, Ct.

GATE HANGERS, HINGES, LATCHES—See Hangers, Hinges, Latches.**GATE HOOKS—See Hooks, Gate and Door.****GATES, Blast—**

American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Miner & Peck Mfg. Co., New Haven, Ct.
J. W. Paxson Co., Philadelphia, Pa.
B. F. Sturtevant Co., Boston, Mass.

GATES, Extension—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.

GATES, FENCE—See Fencing, Gates, &c.**GATES, Oil and Molasses—**

Enterprise Mfg. Co., Shelburne Falls, Mass.
Charles Parker Co., Meriden, Ct.
Taylor & Boggis Foundry Co., Cleveland, O.

GAUGE AND SQUARE COMBINED—

H. H. Mayhew Co., Shelburne Falls, Mass.
Stanley Rule & Level Co., New Britain, Ct.

GAUGE COCKS, SAWS—See Cocks, Saws.**GAUGES, Altitude—**

Ashton Valve Co., Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.

GAUGES, Ammonia—

Ashton Valve Co., Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.

GAUGES, Bar Iron Limit—

Pratt & Whitney Co., Hartford, Ct.

GAUGES, Bit—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Millers Falls Co., 28 Warren St., New York.

GAUGES, Blast—

Byram & Co., Detroit, Mich.
J. W. Paxson Co., Philadelphia, Pa.

GAUGES, Boiler Plate—

Brown & Sharpe Mfg. Co., Providence, R. I.

GAUGES, Butt and Rabbit—

Stanley Rule & Level Co., New Britain, Ct.
Tower & Lyon, 95 Chambers St., New York.

GAUGES, Caliper—

Athol Machine Co., Athol, Mass.
Pratt & Whitney Co., Providence, R. I.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.
L. S. Starrett Co., Athol, Mass.

GAUGES, Center—

Athol Machine Co., Athol, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Henry Disston & Sons, Philadelphia, Pa.
Sawyer Tool Co., Fitchburg, Mass.
L. S. Starrett Co., Athol, Mass.

GAUGES, Chisel—

Stanley Rule & Level Co., New Britain, Ct.

GAUGES, Clapboard—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Rule & Level Co., New Britain, Ct.

GAUGES, Combination—

Henry Disston & Sons, Philadelphia, Pa.

GAUGES, Decimal Sheet Metal—

Pratt & Whitney Co., Providence, R. I.

GAUGES, Depth—

Athol Machine Co., Athol, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Gould & Eberhardt, Newark, N. J.
Sawyer Tool Co., Fitchburg, Mass.
L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
T. F. Welch Mfg. Co., Boston, Mass.

GAUGES, Drill—

Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Machine Co., New Bedford, Mass.
T. F. Welch Mfg. Co., Boston, Mass.

GAUGES, Gear Tooth—

Gould & Eberhardt, Newark, N. J.

GAUGES, Hydraulic—

Ashton Valve Co., Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Watson-Stillman Co., 204-210 East 43d St., New York.

GAUGES, Jointer—

Millers Falls Co., 28 Warren St., New York.

GAUGES, Lumber—

Lufkin Rule Co., Saginaw, Mich.

GAUGES, Marking—

Henry Disston & Sons, Philadelphia, Pa.
Stanley Rule & Level Co., New Britain, Ct.

GAUGES, Master Car Builders—

Pratt & Whitney Co., Providence, R. I.

GAUGES, Metric—

Brown & Sharpe Mfg. Co., Providence, R. I.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.

GAUGES, Micrometer—

Brown & Sharpe Mfg. Co., Providence, R. I.
J. T. Slocumb & Co., Providence, R. I.
L. S. Starrett Co., Athol, Mass.

GAUGES, Plane—

Goodell-Pratt Co., Greenfield, Mass.

GAUGES, Plug and Ring—

Brown & Sharpe Mfg. Co., Providence, R. I.
Pratt & Whitney Co., Providence, R. I.

GAUGES, Pressure—

Ashton Valve Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston.
Gleason-Peters Air Pump Co., Houston & Mercer Sts., New York.
Manning, Maxwell & Moore, 85 Liberty St., New York.
B. F. Sturtevant Co., Boston, Mass.

GAUGES, Pyrometer, Steam—

Ashton Valve Co., Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.

GAUGES, Recording—

Ashton Valve Co., Boston, Mass.
Bristol Co., Waterbury, Ct.
Crosby Steam Gage & Valve Co., Boston.
Manning, Maxwell & Moore, 85 Liberty St., New York.

GAUGES, Recording, Light Pressure—

Uehling, Steinbart & Co., Newark, N. J.

GAUGES, Recording, Light Vacuum—

Uehling, Steinbart & Co., Newark, N. J.

GAUGES, Rolling Mill—

Haines Gauge Co., Philadelphia, Pa.

GAUGES, Saw Tooth—

E. C. Atkins & Co., Indianapolis, Ind.

GAUGES, Scratch, Surface, &c.

Billings & Spencer Co., Hartford, Ct.
Springfield Machine Screw Co., Springfield, Mass.
L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

GAUGES, Screw Pitch—

Athol Machine Co., Athol, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Pratt & Whitney Co., Providence, R. I.
Sawyer Tool Co., Fitchburg, Mass.
L. S. Starrett Co., Athol, Mass.

GAUGES, Sheet Metal—

Brown & Sharpe Mfg. Co., Providence, R. I.

GAUGES, Shrinkage—

Pedrick & Ayer Co., Philadelphia, Pa.

GAUGES, Snap—

Billings & Spencer Co., Hartford, Ct.
Cleveland Twist Drill Co., Cleveland, O.
Pratt & Whitney Co., Providence, R. I.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.

GAUGES, Steam and Vacuum—

Ashton Valve Co., Boston, Mass.
Bristol Co., Waterbury, Ct.
Crosby Steam Gage & Valve Co., Boston.
Lunkenheimer Company, Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St., New York.

GAUGES, Surface—

Athol Machine Co., Athol, Mass.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Brown & Sharpe Mfg. Co., Providence, R. I.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.
Sawyer Tool Co., Fitchburg, Mass.
L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

GAUGES, Track—

Jos. F. McCoy Co., 26 Warren St., N. Y.

GAUGES, Twist Drill—

Brown & Sharpe Mfg. Co., Providence, R. I.

GAUGES, Water—

Ashton Valve Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston.
Lunkenheimer Company, Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St., New York.
McNab & Harlin Mfg. Co., 56 John St., New York.

GAUGES, Water Level Recording—

Bristol Co., Waterbury, Ct.

GAUGES, Wire—

Brown & Sharpe Mfg. Co., Providence, R. I.
Henry Disston & Sons, Philadelphia, Pa.
Standard Tool Co., Cleveland, O.
L. S. Starrett Co., Athol, Mass.
Wright & Colton Wire Cloth Co., Worcester, Mass.

GAUGING RODS—See Rods, Gauging.**GEAR BLANKS, CUTTERS, IRONS, PLANERS—See Blanks, Cutters, Irons, Planers.****GEAR CUTTING—**

F. H. Bultman & Co., Cleveland, O.
Gleason Tool Co., Rochester, N. Y.
Gould & Eberhardt, Newark, N. J.
Edwin Harrington Son & Co., Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
W. A. Wilson, Rochester, N. Y.

GEAR CUTTING ATTACHMENTS FOR MILLING MACHINES—

Brown & Sharpe Mfg. Co., Providence, R. I.

GEAR CUTTING MACHINES—

Boston Gear Works, Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
F. H. Bultman & Co., Cleveland, O.
Dwight Slate Machine Co., Hartford, Ct.
Garvin Machine Co., Spring & Varick Sts., New York.
Gleason Tool Co., Rochester, N. Y.
Gould & Eberhardt, Newark, N. J.
Edwin Harrington, Son & Co., Philadelphia, Pa.
Lucas & Gilem, Philadelphia, Pa.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Hushart Machinery Co., Chicago, Ill.
Niles Tool Works Co., Hamilton, O.
R. D. Nuttall Co., Allegheny, Pa.
Pratt & Whitney Co., Hartford, Ct.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Sigourney Tool Co., Hartford, Ct.
D. E. Whiton Machine Co., New London, Ct.

GEARING, Worm—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Gould & Eberhardt, Newark, N. J.
Morse, Williams & Co., Philadelphia, Pa.
R. Poole & Son Co., Baltimore, Md.

GEAR LUBRICANTS—See Lubricants, Gear.**GEARS—**

E. P. Allis Co., Milwaukee, Wis.
Aultman Co., Canton, O.
Bignall & Keeler Mfg. Co., Edwardsville, Ill.
Boston Gear Works, Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
F. H. Bultman & Co., Cleveland, O.
Chester Steel Casting Co., Philadelphia.

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.

Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Dubuque Machine Concern, Dubuque, Iowa.
Fairmount Machine Co., Philadelphia, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
H. H. Franklin Mfg. Co., Syracuse, N. Y.
Ferro-Carbon Castings Co., Philadelphia.
Filer & Stowell Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Gleason Tool Co., Rochester, N. Y.
Gould & Eberhardt, Newark, N. J.
E. Harrington, Son & Co., Philadelphia, Pa.
Heyl & Patterson, Pittsburgh, Pa.
Horsburgh & Scott, Cleveland, Pa.
F. W. Iredell, 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.
James Leffel & Co., Springfield, O.
Link-Belt Engineering Co., Philadelphia.
R. D. Nuttall Co., Allegheny, Pa.
F. R. Patch Mfg. Co., Rutland, Vt.
R. Poole & Son Co., Baltimore, Md.
Stow Flexible Shaft Co., Philadelphia, Pa.
T. F. Welch Mfg. Co., Boston, Mass.
T. B. Woods' Sons, Chambersburg, Pa.

GEARS, Cast—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Geo. V. Cresson Co., Philadelphia, Pa.
Ferro-Carbon Castings Co., Philadelphia.
Henry B. Newhall, 26 Cortlandt St., N. Y.
R. Poole & Sons Co., Baltimore, Md.

GEARS, Compensating Bevel—

Boston Gear Works, Boston, Mass.

GEARS, Equalizing—

Link-Belt Engineering Co., Philadelphia.

GEARS, Machine Moulded—

Geo. V. Cresson Co., Philadelphia, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
R. Poole & Sons Co., Baltimore, Md.
Mesta Machine Co., Pittsburgh, Pa.

GEARS, Raw Hide—

Geo. V. Cresson Co., Philadelphia, Pa.
Horsburgh & Scott, Cleveland, O.
Nazel & Bassett, Philadelphia, Pa.
Robert Poole & Son Co., Baltimore, Md.

GEARS, Steam Steering—

Edson Mfg. Co., Boston, Mass.

GEAR WHEEL CUTTING, Internal—

Brown & Sharpe Mfg. Co., Providence, R. I.
Gould & Eberhardt, Newark, N. J.
Pratt & Whitney Co., Hartford, Ct.

GEM PANS—See Pans, Gem.**GENERATORS, Electric—See Dynamos.****GENERATORS, Gasoline—**

Schneider & Trenkamp Co., Cleveland, O.

GERMAN SILVER—

Bridgeport Brass Co., Bridgeport, Ct.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.
E. H. Stroud & Co., Chicago, Ill.
Waterbury Brass Co., Waterbury, Ct.

GERMAN SILVER TUBING—See Tubing.**GIMLETS AND GIMLET BITS—**

Goodell-Pratt Co., Greenfield, Mass.
C. E. Jennings Co., 101 Reade St., N. Y.
H. H. Mayhew Co., Shelburne Falls, Mass.
Norton Mfg. Co., Chester, Ct.
F. H. Perry & Co., Chester, Ct.
Snell Mfg. Co., Fiskdale, Mass.

GLS, Ice Hoisting—

W. T. Wood & Co., Arlington, Mass.

GIRDER CLAMPS, RAILS—See Clamps, Rails.**GIRDERS—See Buildings and Bridges—****GIRTS, Web—**

Covert Mfg. Co., West Troy, N. Y.

GLASS BOARDS—See Boards, Glass.

GLASS, Cut—
S. F. Myers & Co., 48-50 Maiden Lane, N. Y.

GLASS CUTTERS, GLASS TUBE CUTTERS—See Cutters.

GLASSES HOLDERS—See Holders, Glasses.

GLASS HOOKS—See Hooks, Glass.

GLASS TUBES—See Tubes, Glass.

GLAZIERS' POINTS, RULES—See Points, Rules.

GLOBE STRAINERS—See Strainers, Section, Globe, &c.

GLOVE BOXES—See Boxes, Silver Plated.

GLUE—
Baeder, Adamson & Co., Philadelphia, Pa.

GLUE HEATERS—See Heaters, Glue.

GOLD OR PLATERS' METAL—See Metal, Platers' or Gold.

GOLF CLUBS, IRONS—See Clubs, Irons.

GOLF HEAD LATHES—See Lathes, Golf Head.

GONG BELLS—See Bells, Gong.

GONGS—
U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

GOUGES, TANGED, SOCKET—See Chisels and Gouges.

GOVERNORS, Gas—
Wilbraham-Baker Blower Co., Philadelphia.

GOVERNORS, Pump—
Mason Regulator Co., Boston, Mass.

GOVERNORS, Tank—
Mason Regulator Co., Boston, Mass.

GRABS, Rafter—See Grapples, Rafter.

GRADERS, ROAD—See Levelers and Graders, Road.

GRADUATED SCALES—See Scales, Graduated.

GRAIN CRADLES, ELEVATORS, SCALES, SCOOPS—See Cradles, Elevators, Scales, Scoops.

GRAIN HANDLING MACHINERY—
Dodge Mfg. Co., Mishawaka, Ind.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.

GRANARIES, Portable—
W. J. Adam, Joliet, Ill.

GRAPE HOES—See Hoes, Grape.

GRAPHITE—
Cleveland Facing Mill Co., Cleveland, O.
Jos. Dixon Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.

GRAPPLES, ICE—See Ice Harvesting Tools.

GRAPPLES, Rafter—
Janesville Hay Tool Co., Janesville, Wis.
F. E. Myers & Bro., Ashland, O.
Ney Mfg. Co., Canton, O.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

GRAPPLING IRONS—See Irons, Grappling.

GRASS CATCHERS AND COLLECTORS—See Catchers, Grass.

GRATE BARS—
Wm. Bayley & Sons Co., Milwaukee, Wis.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
W. W. Whitehead, Davenport, Iowa.

GRATE DAMPERS, GUARDS—See Dampers, Guards.

GRATERS, Corn—
Henry Disston & Sons, Philadelphia, Pa.

GRATERS, Horse Radish, &c.—
Enterprise Mfg. Co., Philadelphia, Pa.

GRATERS, Nutmeg—
Caldwell Mfg. Co., Rochester, N. Y.
Nelson Lyon, Albany, N. Y.

GRATES, EXTENSION—See Stove Repairs.

GRATES, Mantel—
Murdock Parlor Grate Co., Boston, Mass.

GRATES, Rocking—
Geo. B. Sennett Co., Youngstown, O.

GRATINGS, AREA—See Iron Work, Builders'.

GRATINGS, Foundation, Sewer, &c.—
Wm. Bayley & Sons Co., Milwaukee, Wis.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

GRAVEL FURNACES—See Furnaces, Portable, &c.

GREASE, Axle—
Joseph Dixon Crucible Co., Jersey City.

GRIDDLES, Cake—
Adams Co., Dubuque, Ia.

GRIDDLES, Soapstone—
Pike Mfg. Co., Pike Station, N. H.

GRILLES, IRON—See Iron, Ornamental.

GRINDERS' AND POLISHERS' SUPPLIES—
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Carborundum Co., Niagara Falls, N. Y.
Diamond Machine Co., Providence, R. I.
Hanson & Van Winkle Co., Newark, N. J.
Maxwell M. Mayer Electric Co., 2d Ave. & 121st St., New York.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

GRINDERS, Bench—
American Emery Wheel Works, Providence, R. I.
Bicknell Hardware Co., Janesville, Wis.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Diamond Machine Co., Providence, R. I.
Springfield Mfg. Co., Bridgeport, Ct.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Vitrified Emery Wheel Co., Westfield, Mass.
Webster & Perks Tool Co., Springfield, O.

GRINDERS, Car Wheel—
Springfield Mfg. Co., Bridgeport, Ct.

GRINDERS, Chisel—
Millers Falls Co., 28 Warren St., New York.

GRINDERS, Cock—
American Tool Works Co., Cincinnati, O.
Pratt & Whitney Co., Hartford, Ct.
Windsor Machine Co., Windsor, Vt.

GRINDERS, Cup, Cone and Hub—
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Diamond Machine Co., Providence, R. I.
Norton Emery Wheel Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Ct.

GRINDERS, Cutter—
Adams Co., Dubuque, Ia.
American Tool Works Co., Cincinnati, O.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Milling Machine Co., Cincinnati, O.
Diamond Machine Co., Providence, R. I.
Garvin Machine Co., Spring & Varick Sts., New York.
Geo. Gorton Machine Co., Racine, Wis.
Gould & Eberhardt, Newark, N. J.
Hill, Clarke & Co., Boston, Mass.
Niles Tool Works Co., Hamilton, O.
Norton Emery Wheel Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Wells Bros. & Co., Greenfield, Mass.
Woodward & Rogers, Hartford, Ct.

GRINDERS, Drill—
American Emery Wheel Works, Providence, R. I.
Cleveland Twist Drill Co., Cleveland, O.
Diamond Machine Co., Providence, R. I.
Fuller Mfg. Co., Kalamazoo, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
L. S. Heald & Son, Barre, Mass.
Hill, Clarke & Co., Boston, Mass.
Landis Tool Co., Waynesboro, Pa.
Niles Tool Works Co., Hamilton, O.
Norton Emery Wheel Co., Worcester, Mass.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Standard Tool Co., Cleveland, O.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Vitrified Emery Wheel Co., Westfield, Mass.
Washburn Shops, Worcester, Mass.

GRINDERS, Lathe—
Chicago Flexible Shaft Co., Chicago, Ill.
Diamond Machine Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Springfield Mfg. Co., Bridgeport, Ct.

GRINDERS, Lathe Center—
Diamond Machine Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Stow Flexible Shaft Co., Philadelphia, Pa.

GRINDERS, Lawn Mower—
Springfield Mfg. Co., Bridgeport, Ct.
Zacharias & Co., Asbury Park, N. J.

GRINDERS, Planer Knife—
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Diamond Machine Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Northampton Emery Wheel Co., Leeds, Mass.
Springfield Mfg. Co., Bridgeport, Ct.
Sterling Emery Wheel Co., Tiffin, O.
Tanite Co., Stroudsburg, Pa.

GRINDERS, Plow Share—
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Springfield Mfg. Co., Bridgeport, Ct.
Webster & Perks Tool Co., Springfield, O.

GRINDERS, Portable—
Diamond Machine Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Stow Flexible Shaft Co., Philadelphia, Pa.
Stow Mfg. Co., Binghamton, N. Y.
Vitrified Emery Wheel Co., Westfield, Mass.

GRINDERS, Reamer—
American Tool Works Co., Cincinnati, O.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Milling Machine Co., Cincinnati, O.
Diamond Machine Co., Providence, R. I.
Garvin Machine Co., Spring & Varick Sts., New York.
Hill, Clarke & Co., Boston, Mass.
Landis Tool Co., Waynesboro, Pa.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

GRINDERS, Roll—
E. Harrington, Son & Co., Philadelphia.
Mesta Machine Co., Pittsburgh, Pa.
Springfield Mfg. Co., Bridgeport, Ct.

GRINDERS, Rotary Shear—
Springfield Mfg. Co., Bridgeport, Ct.

GRINDERS, Shafting—
Springfield Mfg. Co., Bridgeport, Ct.

GRINDERS, Surface—
Bignall & Keeler Mfg. Co., Edwardsville, Ill.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Brown & Sharpe Mfg. Co., Providence, R. I.
Diamond Machine Co., Providence, R. I.
Garvin Machine Co., Spring & Varick Sts., New York.
George Gorton Machine Co., Racine, Wis.
Hill, Clarke & Co., Boston, Mass.
Landis Tool Co., Waynesboro, Pa.
Niles Tool Works Co., Hamilton, O.
Rudolph & Krummel, Chicago, Ill.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Springfield Mfg. Co., Bridgeport, Ct.
Woodward & Rogers, Hartford, Ct.

GRINDERS, Swing Frame—
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Diamond Machine Co., Providence, R. I.
Sterling Emery Wheel Mfg. Co., Tiffin, O.

GRINDERS, Tool—

B. F. Barnes Co., Rockford, Ill.
 W. F. & J. Barnes Co., Rockford, Ill.
 Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Diamond Machine Co., Providence, R. I.
 Dwight Slate Machine Co., Hartford, Ct.
 Fuller Mfg. Co., Kalamazoo, Mich.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Geo. Gorton Machine Co., Racine, Wis.
 Gould & Eberhardt, Newark, N. J.
 Hill, Clarke & Co., Boston, Mass.
 Niles Tool Works Co., Hamilton, O.
 Northampton Emery Wheel Co., Leeds, Mass.
 Norton Emery Wheel Co., Worcester, Mass.
 Pratt & Whitney Co., Hartford, Ct.
 William Sellers & Co. (Inc.), Philadelphia.
 Springfield Mfg. Co., Bridgeport, Ct.
 Sterling Emery Wheel Mfg. Co., Tiffin, O.
 Tanite Co., Stroudsburg, Pa.
 Vittrified Emery Wheel Co., Westfield, Mass.

GRINDERS, Universal—

Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
 Cincinnati Milling Machine Co., Cincinnati, N. Y.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Geo. Gorton Machine Co., Racine, Wis.
 Landis Tool Co., Waynesboro, Pa.
 Niles Tool Works Co., Hamilton, O.
 Norton Emery Wheel Co., Worcester, Mass.
 Springfield Mfg. Co., Bridgeport, Ct.
 Universal Machine Co., Providence, R. I.

GRINDING MACHINES—

American Emery Wheel Works, Boston.
 American Shearer Mfg. Co., Nashua, N. H.
 E. C. Atkins & Co., Indianapolis, Ind.
 Bates Machine Co., Joliet, Ill.
 Chas. H. Besly & Co., Chicago, Ill.
 L. Best, 45 Vesey St., New York.
 Bicknell Hardware Co., Janesville, Wis.
 Blake & Johnson, Waterbury, Ct.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Diamond Machine Co., Providence, R. I.
 Henry Disston & Sons, Philadelphia, Pa.
 Dwight Slate Machine Co., Hartford, Ct.
 Fuller Mfg. Co., Kalamazoo, Mich.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Geo. Gorton Machine Co., Racine, Wis.
 Hanson & Van Winkle Co., Newark, N. J.
 Hill, Clarke & Co., Boston, Mass.
 Kimball Bros. & Sprague, Brockton, Mass.
 Landis Tool Co., Waynesboro, Pa.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 Marshall & Hushart Machinery Co., Chicago, Ill.
 National Saw Co., Newark, N. J.
 Niles Tool Works Co., Hamilton, O.
 Northampton Emery Wheel Co., Leeds, Mass.
 Norton Emery Wheel Co., Worcester, Mass.
 Pawling & Harnischfeger, Milwaukee, Wis.
 Pennsylvania Machinery Co., Philadelphia, Pa.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Rudolph & Krummel, Chicago, Ill.
 Safety Emery Wheel Co., Springfield, O.
 Scranton Corundum & Emery Wheel Co., Scranton, Pa.
 Springfield Mfg. Co., Bridgeport, Ct.
 Star Corundum Wheel Co., Detroit, Mich.
 Sterling Emery Wheel Mfg. Co., Tiffin, O.
 Stow Mfg. Co., Binghamton, N. Y.
 Tanite Co., Stroudsburg, Pa.
 Frank Toomey, Philadelphia, Pa.
 Universal Machine Co., Providence, R. I.
 Vittrified Emery Wheel Co., Westfield, Mass.
 Washburn Shops, Worcester, Mass.
 Webster & Perks Tool Co., Springfield, O.
 S. M. York Co., Cleveland, O.
 Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

GRINDING MACHINES, Bushing—

Landis Tool Co., Waynesboro, Pa.
 Pratt & Whitney Co., Hartford, Ct.

GRINDING WHEELS—See Wheels, Grinding.**GRINDSTONE BOXES—**

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 Niles Tool Works Co., Hamilton, O.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

GRINDSTONE FIXTURES—

Cleveland Stone Co., Cleveland, O.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
 Wrightsville Hardware Co., Wrightsville, Pa.

GRINDSTONES, Ball Bearing—

Velox Machine Works, Chicago, Ill.

GRINDSTONES, Family—

Cleveland Stone Co., Cleveland, O.
 Millers Falls Co., 28 Warren St., New York.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.

GRINDSTONES, Mounted—

Cleveland Stone Co., Cleveland, O.
 Velox Machine Works, Chicago, Ill.

GRINDSTONES, Unmounted—

Cleveland Stone Co., Cleveland, O.
 Pike Mfg. Co., Pike Station, N. H.

GRINDSTONE TRUING DEVICES—

Chas. H. Besly & Co., Chicago, Ill.
 Brown & Sharpe Mfg. Co., Providence, R. I.

GRIPS, Bicycle—

J. S. Leug's Son & Co., 4 Fletcher St., N. Y.

GRIPS, Cable—

A. Leschen & Sons Rope Co., St. Louis, Mo.

GRIPS, Cord and Line—

Samson Cordage Works, Boston, Mass.

GRIPS, Nipple, Bicycle—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

GRIPS, Spoke, Bicycle—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

GRIPS, Wood, Malleable D's—

Avery Stamping Co., Cleveland, O.

GRIST MILLS, Family—See Mills, Family Grist.**GROOMING MACHINES—**

American Shearer Mfg. Co., Nashua, N. H.

GROOVING MACHINES—

Niagara Machine & Tool Works, Buffalo, N. Y.
 Stow Mfg. Co., Binghamton, N. Y.

GROUND THAWERS—See Thawers, Kerosene Ground.**GUARDS, Bicycle—**

Stover Mfg. Co., Freeport, Ill.

GUARDS, Electric Light—

Edward Darby & Sons, Philadelphia, Pa.
 Ludlow-Saylor Wire Co., St. Louis, Mo.

GUARDS, &c., Elevator—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Howard & Morse, 45 Fulton St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Scheeler's Sons, Buffalo, N. Y.
 W. S. Tyler Co., Cleveland, O.

GUARDS, Flower and Tomato—

De Kalb Fence Co., De Kalb, Ill.

GUARDS, Gas Jet—

Edward Darby & Sons, Philadelphia, Pa.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Howard & Morse, 45 Fulton St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.

GUARDS, Grate—

E. T. Barnum, Detroit, Mich.
 Columbus Wire & Iron Works, Columbus, O.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Edward Darby & Sons, Philadelphia, Pa.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Howard & Morse, 45 Fulton St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Scheeler's Sons, Buffalo, N. Y.

GUARDS, Grave—

Columbus Wire & Iron Works, Columbus, O.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Edward Darby & Sons, Philadelphia, Pa.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Fred. J. Meyers Mfg. Co., Hamilton, O.

GUARDS, SKYLIGHT—See Iron Work, Builders'.**GUARDS, Snow and Ice—**

Cleveland Wire Spring Co., Cleveland, O.

GUARDS, Tree—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Columbus Wire & Iron Works, Columbus, O.
 Edward Darby & Sons, Philadelphia, Pa.
 De Kalb Fence Co., De Kalb, Ill.
 Hartman Mfg. Co., Ellwood City, Pa.
 Howard & Morse, 45 Fulton St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Scheeler's Sons, Buffalo, N. Y.
 Stewart Iron Works, Cincinnati, O.
 Up-to-Date Mfg. Co., Terre Haute, Ind.
 Van Dorn Iron Works Co., Cleveland, O.

GUARDS, Trouser—

Bevin Bros. Mfg. Co., Easthampton, Ct.
 John H. Graham & Co., 113 Chambers St., New York.
 Tower & Lyon, 95 Chambers St., N. Y.

GUARDS, WINDOW, IRON—See Iron, Ornamental.**GUARDS, Window Wire—**

Columbus Wire & Iron Works, Columbus, O.
 Edward Darby & Sons, Philadelphia, Pa.
 Forest City Steel & Iron Co., Cleveland, O.
 Hartman Mfg. Co., Ellwood City, Pa.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Murdock Parlor Grate Co., Boston, Mass.
 Up-to-Date Mfg. Co., Terre Haute, Ind.
 Van Dorn Iron Works Co., Cleveland, O.

GUIDES, Band Saw—

Filer & Stowell Co., Milwaukee, Wis.
 Simonds Mfg. Co., Fitchburg, Mass.

GUIDES, Engine, Shapes for—

Finished Steel Co., Youngstown, O.

GUIDES, Sheet and Rope—

W. & J. Tiebout, 118 Chambers St., N. Y.

GUITAR CLAMP SCREWS—See Screws, Guitar and Violin Clamp.**GUMMER CUTTERS—See Cutters, Gummer.****GUMMERS, Saw—**

E. C. Atkins & Co., Indianapolis, Ind.
 Henry Disston & Sons, Philadelphia, Pa.
 National Saw Co., Newark, N. J.
 Silver Mfg. Co., Salem, O.
 Tanite Co., Stroudsburg, Pa.
 Wickes Bros., Saginaw, Mich.

GUN CARRIAGES, FORGINGS—See Carriages, Forgings.**GUN IMPLEMENTS—**

Bridgeport Gun Implement Co., 313 Broadway, New York.
 Ideal Mfg. Co., New Haven, Ct.
 Remington Arms Co., 313 Broadway, N. Y.
 Union Hardware Co., Torrington, Ct.
 Waterbury Brass Co., Waterbury, Ct.

GUN MACHINERY—

Detrick & Harvey Machine Co., Baltimore.
 Pratt & Whitney Co., Hartford, Ct.

GUNS, Insect Powder—

Goodell Co., Antrim, N. H.

GUNS, Rapid Fire—

Bethlehem Steel Co., South Bethlehem, Pa.

GUNS, Shot—

Harrington & Richardson Arms Co., Worcester, Mass.
 Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
 Marlin Fire Arms Co., New Haven, Ct.
 Remington Arms Co., 313 Broadway, N. Y.
 J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

GUN WADS—See Wads, Gun.**GUTTERS—See Eave Troughs and Gutters.**

GUTTERS IN ROLLS—See Valleys and Gutters in Rolls.

GUY STRAND WIRE—See Wire Strand Guy, Galvanized.

GYMNASIUM WARDROBES—See Lockers.

GYMNASTIC APPARATUS—

Narragansett Machine Co., Providence, R. I.

HACK SAWS AND HACK SAW BLADES—See Saws, Hack, and Hack Saw Blades.

HACK SAWS, POWER—See Saws, Power, Hack.

HAIR BRUSHES—See Brushes, Silver Plated.

HAIR, Curled—

Baeder, Adamson & Co., Philadelphia, Pa.

HAIR FELTING—See Felting, Hair.

HAIRPIN WIRE—See Wire Hairpin.

HAIR STRAIGHTENERS—See Straighteners, Hair.

HALF HATCHETS—See Hatchets, Shingling, Half, &c.

HALTER BUCKLES, CHAINS, &c.—See Buckles, Chains, &c.

HALTERS, Rope, Web, &c.—

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.

HAME STRAPS—See Straps, Hame.

HAMMER HANDLES—See Handles, Hammer.

HAMMERS, Brass—

T. F. Welch Mfg. Co., Boston, Mass.

HAMMERS, Bronze—

Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.

HAMMERS, Chain Link Welding—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

HAMMERS, Confectioners', Candy—

Erle Specialty Co., Erle, Pa.

HAMMERS, Copper—

U. T. Hungerford Brass & Copper Co., 12 Worth St., New York.
Merchant & Co., Philadelphia, Pa.

HAMMERS, Copper Tipped—

Union Hardware Co., Torrington, Ct.

HAMMERS, Drop—

Bement, Miles & Co., Philadelphia, Pa.
Billings & Spencer Co., Hartford, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Danielson Machine & Tool Co., Cleveland, O.
Hill, Clarke & Co., Boston, Mass.
Long & Allstatter Co., Hamilton, Ohio.
Marshall & Huschart Machinery Co., Chicago, Ill.
Merrill Bros., Brooklyn, N. Y.
A. H. Merriman, Meriden, Ct.
Miner & Peck Co., New Haven, Ct.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
A. B. Pitkin Machinery Co., Providence, R. I.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Williams, White & Co., Moline, Ill.
Woolley Foundry & Machine Works, Anderson, Ind.

HAMMERS, Handled—

Arcade Mfg. Co., Freeport, Ill.
Billings & Spencer Co., Hartford, Ct.
Chantrell Tool Co., Reading, Pa.
Ferro-Carbon Castings Co., Philadelphia.
Heller Bros. Co., Newark, N. J.
Logan & Strobridge Iron Co., New Brighton, Pa.

New England Specialty Co., North Easton, Mass.

Niagara Machine & Tool Works, Buffalo, N. Y.

Peck, Stow & Wilcox Co., 27 Murray St., New York.

Stover Mfg. Co., Freeport, Ill.

Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

HAMMERS, HEAVY—See Sledges and Hammers.

HAMMERS, Heavy, and Sledges—

Heller Bros. Co., Newark, N. J.
Van Wagoner & Williams Hardware Co., Cleveland, O.

HAMMERS, Paving—

E. C. Atkins & Co., Indianapolis, Ind.

HAMMERS, Pneumatic—

Chicago Pneumatic Tool Co., Chicago, Ill.
Thos. H. Dallett & Co., Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Philadelphia Pneumatic Tool Co., Philadelphia, Pa.
Standard Pneumatic Tool Co., Chicago, Ill.
Wals & Roos Punch & Shear Co., Cincinnati, O.

HAMMERS, Power—

Beaudry & Co., Boston, Mass.
Belden Machine Co., New Haven, Ct.
Bradley Co., Syracuse, N. Y.
Dienelt & Eisenhardt, Philadelphia, Pa.
Dubuque Machine Concern, Dubuque, Ia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Hill, Clarke & Co., Boston, Mass.
R. E. Kidder, Worcester, Mass.
Long & Allstatter Co., Hamilton, O.
Marshall & Huschart Machinery Co., Chicago, Ill.
Merrill Bros., Brooklyn, N. Y.
Niles Tool Works Co., Hamilton, O.
A. B. Pitkin Machinery Co., Providence, R. I.
Scranton & Co., New Haven, Ct.
Williams, White & Co., Moline, Ill.
Woolley Foundry & Machine Works, Anderson, Ind.

HAMMERS, Rotary Riveting—

F. B. Shuster Co., New Haven, Ct.
Williams, White & Co., Moline, Ill.

HAMMERS, Saddlers' and Upholsterers'—

Stanley Rule & Level Co., New Britain, Ct.

HAMMERS, Shoe—

Adams Co., Dubuque, Ia.
John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pieuger & Henger Mfg. Co., St. Louis, Mo.
Star Heel Plate Co., Newark, N. J.
Wrightsville Hardware Co., Wrightsville, Pa.

HAMMERS, Steam—

U. Baird Machinery Co., Pittsburgh, Pa.
Bement, Miles & Co., Philadelphia, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Richard Dudgeon, 24 Columbia St., N. Y.
Hill, Clarke & Co., Boston, Mass.
Niles Tool Works Co., Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
F. R. Phillips' Sons, Philadelphia, Pa.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
William Sellers & Co. (Inc.), Philadelphia.

HAMMERS, Tack—

Arcade Mfg. Co., Freeport, Ill.
Logan & Strobridge Iron Co., New Brighton, Pa.
New England Specialty Co., North Easton, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Rule & Level Co., New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Albany, N. Y.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

HAMMERS, Tinners'—

C. S. Mersack & Co., New Haven, Ct.
Niagara Machine & Tool Works, Buffalo, N. Y.

HAMMOCK CORDS, HOOKS, &c.—See Cords, Hooks, &c.

HAMMOCKS—

I. E. Palmer, Middletown, Ct.

HAM STRINGERS—See Stringers, Ham.

HAND BELLS, DRILLS, &c.—See Bells, Drills, &c.

HAND CUFFS—

Tower & Lyon, 95 Chambers St., New York.

HAND HOIST CARRIERS—See Carriers, Hand Hoist.

HAND HOLD PUNCHES—See Punches, Hand and Tube Hole.

HANDLE BAR CLAMPS—See Clamps, Handle Bar.

HANDLE BARS—See Bicycle Parts.

HANDLED HAMMERS—See Hammers, Handled.

HANDLE MACHINES, Plow—

Defiance Machine Works, Defiance, O.

HANDLES AND LOCKS, Store Door—

Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

HANDLES, Auger—

R. Bliss Mfg. Co., Pawtucket, R. I.
W. R. Hartigan, Collinsville, Ct.
Millers Falls Co., 28 Warren St., New York.

HANDLES, Bag and Box, &c.

R. C. Jenkinson & Co., Newark, N. J.

HANDLES, Basket, Wire—

E. H. Titchener & Co., Binghamton, N. Y.

HANDLES, Boiler—

Troy Nickel Works, Albany, N. Y.

HANDLES, Carriage Door—

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

HANDLES, Chest, Shutter, &c.—

Coleman Hardware Co., Chicago, Ill.
Logan & Strobridge Iron Co., New Brighton, Pa.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Works, New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland, O.
W. & J. Tiebout, 118 Chambers St., N. Y.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

HANDLES, Chisel, File, Awl, &c.—

R. Bliss Mfg. Co., Pawtucket, R. I.
Buck Bros., Milbury, Mass.
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
W. R. Hartigan, Collinsville, Ct.
C. E. Jennings Co., 101 Reade St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Rule & Level Co., New Britain, Ct.
Star Heel Plate Co., Newark, N. J.
Union Hardware Co., Torrington, Ct.

HANDLES, Crosscut Saw—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Lawrenceburg, Ind.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
Simonds Mfg. Co., Fitchburg, Mass.

HANDLES, Detachable Tool—

Millers Falls Co., 28 Warren St., New York.
Nicholson File Co., Providence, R. I.

HANDLES, Door—

Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland.

HANDLES, Door Bell—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

HANDLES, Drawer—

Norwalk Lock Co., South Norwalk, Ct.
 Russell & Erwin Mfg. Co., 43-47 Chambers
 St., New York.
 Reading Hardware Co., Reading, Pa.
 Stover Mfg. Co., Freeport, Ill.

HANDLES, Fork, Spade, &c.—

Avery Stamping Co., Cleveland, O.
 Ely Hoe & Fork Co., St. Johnsbury, Vt.
 Iowa Farming Tool Co., Ft. Madison, Ia.
 Withington & Cooley Mfg. Co., Jackson,
 Mich.

HANDLES, Furnace Door—

Troy Nickel Works., Albany, N. Y.

HANDLES, Hammer—

Star Heel Plate Co., Newark, N. J.

HANDLES, Hand Saw—

E. C. Atkins Co., Indianapolis, Ind.
 Geo. H. Bishop & Co., Lawrenceburg, Ind.
 Henry Disston & Sons, Philadelphia, Pa.
 C. E. Jennings Co., 101 Reade St., N. Y.
 National Saw Co., Newark, N. J.

HANDLES, Keyhole Saw—

W. C. Ladd, Bristol, Ct.

HANDLES, Lifting—

Peck, Stow & Wilcox Co., 27 Murray St.,
 New York.
 Reading Hardware Co., Reading, Pa.

HANDLES, Machine—

Billings & Spencer Co., Hartford, Ct.
 Keystone Drop Forge Co., Philadelphia.
 Norwood Bicycle Co., Cincinnati, O.
 Transue & Williams Co., Alliance, O.
 J. H. Williams & Co., Brooklyn, N. Y.

HANDLES, Plane and Saw—

E. C. Atkins & Co., Indianapolis, Ind.
 Henry Disston & Sons, Philadelphia, Pa.
 C. E. Jennings Co., 101 Reade St., N. Y.
 National Saw Co., Newark, N. J.
 Stanley Rule & Level Co., New Britain, Ct.

HANDLES, Sad Iron—

Enterprise Mfg. Co., Philadelphia, Pa.
 M. Schryer's Sons & Co., Chicago, Ill.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.

HANDLES, Sauce Pan—

Troy Nickel Works, Albany, N. Y.

HANDLES, Soldering Copper—

Troy Nickel Works, Albany, N. Y.

HANDLES, Tub—

Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers
 St., New York.
 Stanley Works, New Britain, Ct.
 Wheeling Hinge Co., Wheeling, W. Va.

**HAND RAIL BRACKETS, SCREWS—
See Brackets, Screws.****HAND SCREWS, VISES—See Screws,
Vises.****HANGERS AND RAILS, Suspended—See
Rails and Hangers, Suspended.****HANGER SCREWS—See Screws,
Hanger.****HANGERS, Cycle—**

Lane Bros. Co., Poughkeepsie, N. Y.
 Miller & Van Winkle, Brooklyn, N. Y.

HANGERS, Door—

Chicago Spring Butt Co., Chicago, Ill.
 Chisholm & Moore Mfg. Co., Cleveland, O.
 Coburn Trolley Track Mfg. Co., Holyoke,
 Mass.
 Coleman Hardware Co., Chicago, Ill.
 Janesville Hay Tool Co., Janesville, Wis.
 John C. Kupferle, St. Louis, Mo.
 Lane Bros. Co., Poughkeepsie, N. Y.
 Lawrence Bros., Sterling, Ill.
 Logan & Strobridge Iron Co., New Brigh-
 ton, Pa.
 Loudon Machinery Co., Fairfield, Ia.
 McCabe Hanger Mfg. Co., 533-543 West
 22d St., New York.
 McKinney Mfg. Co., Allegheny, Pa.
 F. E. Myers & Bro., Ashland, O.
 Henry B. Newhall, 26 Cortlandt St., N. Y.
 Ney Mfg. Co., Canton, O.
 Norwalk Lock Co., South Norwalk, Ct.
 Peck, Stow & Wilcox Co., 27 Murray St.,
 New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 Stowell Mfg. & Foundry Co., South Mil-
 waukee, Wis.
 Van Wagoner & Williams Hardware Co.,
 Cleveland, O.
 Wilcox Mfg. Co., Aurora, Ill.
 Wrightsville Hardware Co., Wrightsville,
 Pa.

HANGERS, Eave Trough—

Berger Bros., Philadelphia, Pa.
 Clark, Quien & Morse, Peoria, Ill.
 Garry Iron & Steel Roofing Co., Cleve-
 land, O.
 Kanneberg Roofing Co., Canton, O.
 Merchant & Co., Philadelphia, Pa.

HANGERS, Garment and Trousers—

Caldwell Mfg. Co., Rochester, N. Y.
 Edward Darby & Sons, Philadelphia, Pa.
 Tucker & Dorsey Mfg. Co., Indianapolis,
 Ind.
 Van Wagoner & Williams Hardware Co.,
 Cleveland, O.

HANGERS, Gate—

F. E. Myers & Bro., Ashland, O.

HANGERS, Joist—

W. J. Clark Co., Salem, O.
 National Iron & Wire Co., Cleveland, O.
 Van Wagoner & Williams Hdw. Co., Cleve-
 land, O.
 Van Dorn Iron Works Co., Cleveland, O.

HANGERS, Pipe—

Jenkins Bros., 71 John St., New York.
 McNab & Harlin Mfg. Co., 56 John St.,
 New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.

HANGERS, Post—

Bates Machine Co., Joliet, Ill.
 Geo. V. Cresson Co., Philadelphia, Pa.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Machinists' Supply Co., Rochester, N. Y.
 Robert Poole & Son Co., Baltimore, Md.
 T. B. Woods' Sons, Chambersburg, Pa.

HANGERS, Shaft—

Edw. P. Allis Co., Milwaukee, Wis.
 Aultman Co., Canton, O.
 Baker Bros., Toledo, O.
 Ball Bearing Co., Boston, Mass.
 Bates Machine Co., Joliet, Ill.
 Boston Gear Works, Boston, Mass.
 Braddock Machine & Mfg. Co., Braddock,
 Pa.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Geo. V. Cresson Co., Philadelphia, Pa.
 Dodge Mfg. Co., Mishawaka, Ind.
 Fairmount Machine Co., Philadelphia, Pa.
 Filler & Stowell Co., Milwaukee, Wis.
 Hess, Snyder & Co., Massillon, O.
 Heyl & Patterson, Pittsburgh, Pa.
 Howard Iron Works, Buffalo, N. Y.
 Jeffrey Mfg. Co., Columbus, O.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Keagy & Lear Machine Co., Coshocton, O.
 Lane & Bodley Co., Cincinnati, O.
 Link-Belt Engineering Co., Philadelphia.
 Machinists' Supply Co., Rochester, N. Y.
 Mossberg & Granville Mfg. Co., Providence,
 R. I.
 A. B. Pitkin Machinery Co., Providence,
 R. I.
 R. Poole & Son Co., Baltimore, Md.
 Wm. Sellers & Co. (Inc.), Philadelphia.
 B. F. Sturtevant Co., Boston, Mass.
 Variety Machine Co., Warsaw, N. Y.
 T. B. Woods' Sons, Chambersburg, Pa.

HANGERS, Timber—

Van Wagoner & Williams Hdw. Co., Cleve-
 land, O.

HANGERS, Wall—

Van Wagoner & Williams Hdw. Co., Cleve-
 land, O.

**HANGERS, Window Screen and Storm
Sash—**

Phenix Mfg. Co., Milwaukee, Wis.

**HANGING BASKETS, LAMPS—See Bas-
kets, Lamps.****HARDENERS, Felt—**

Farrel Foundry & Mach. Co., Ansonia, Ct.

HARDIES—

Heller Bros. Co., Newark, N. J.

**HARDWARE, Carriage and Wagon—
See Carriage and Wagon Hardware.****HARDWARE COMMISSION MEK-
CHANTS—See Agents.****HARDWARE JOBBERS—See Jobbers,
Hardware, Cutlery, &c.****HARDWARE SHELF BOXES—See
Boxes, Shelf.****HARDWARE SHELVING DISPLAY
Doors—See Doors, Hardware Shelv-
ing Display.****HARDWARE STORE SHELVING—See
Shelving.****HARDWARE, TRUNK AND BAG—See
Corners, Clamps, Locks, Frames,
Handles, &c.****HARNESS AND STRAP WORK—**

Morley Bros., Saginaw, Mich.

**HARNESS CHAINS, &c.—See Chains,
Hooks, &c.****HARPOONS—**

W. & J. Tiebout, 118 Chambers St., N. Y.

**HARROW DISCS, TEETH—See Discs,
Teeth.****HARROWS—**

W. C. Heller & Co., Montclair, N. J.
 Long & Allstatter Co., Hamilton, O.
 Orangeville Agricultural Works & Foundry,
 Orangeville, Pa.
 Syracuse Chilled Plow Co., Syracuse, N. Y.

HASPS, Hinge—

Lawrence Bros., Sterling, Ill.
 McKinney Mfg. Co., Allegheny, Pa.
 Reading Hardware Co., Reading, Pa.
 Stanley Works, New Britain, Ct.
 Wheeling Hinge Co., Wheeling, W. Va.

HAT BADGES—See Badges and Medals.**HATCHETS—**

Jenkins Iron & Tool Co., Howard, Pa.

**HATCH DOORS—See Doors, Automatic
Hatch.****HATCHETS, Confectioners'—**

Logan & Strobridge Iron Co., New Brigh-
 ton, Pa.

HATCHETS, Ice—

Logan & Strobridge Iron Co., New Brigh-
 ton, Pa.
 Mason & Parker, Winchenden, Mass.
 A. C. Williams, Ravenna, O.

HATCHETS, Shingling, Half, &c.—

Chantrell Tool Co., Reading, Pa.
 Ferro-Carbon Castings Co., Philadelphia.
 Logan & Strobridge Iron Co., New Brigh-
 ton, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St.,
 New York.
 Wiebusch & Hilger, Ltd., 9-15 Murray St.,
 New York.
 A. C. Williams, Ravenna, O.
 L. & I. J. White Co., Buffalo, N. Y.
 Wrightsville Hardware Co., Wrightsville,
 Pa.

HAULAGE PLANTS—

Thos. Carlin's Sons, Allegheny, Pa.
 Trenton Iron Co., Trenton, N. J.

HAULS, LOG—See Log Hauls.**HAY FORK CARRIERS, PULLEYS—
See Haying Tools, Pulleys.****HAY FORKS—See Forks, Hay, Manure,
Spading, &c.****HAYING TOOLS (Forks, Slings and
Carriers)—**

Goshen Mfg. Co., Goshen, Ind.
 Janesville Hay Tool Co., Janesville, Wis.
 Loudon Machinery Co., Fairfield, Ia.
 F. E. Myers & Bro., Asoland, O.
 Ney Mfg. Co., Canton, O.
 Red Jacket Mfg. Co., Davenport, Ia.
 Stowell Mfg. & Foundry Co., South Milwau-
 kee, Wis.
 Syracuse Chilled Plow Co., Syracuse, N. Y.
 Variety Machine Co., Warsaw, N. Y.

**HAY KNIVES, PRESSES, ROPE,
STACKERS—See Knives, Presses,
Rope, Stackers.****HAY STACKERS—See Stackers, Hay.****HEADER AND BENDER, BICYCLE
SPOKE—See Spoke Header and
Bender, Bicycle.****HEADERS, Barrel—**

Variety Machine Co., Warsaw, N. Y.

HEADERS, Bolt—

Acme Machinery Co., Cleveland, O.
 Ajax Mfg. Co., Cleveland, O.
 National Machinery Co., Tiffin, O.
 Niles Tool Works Co., Hamilton, O.
 Wells Bros. & Co., Greenfield, Mass.

HEADERS, Rivet—

Ajax Mfg. Co., Cleveland, O.

HEADERS, Rod—

Automatic Machine Co., Bridgeport, Ct.
Blake & Johnson, Waterbury, Ct.
E. J. Manville Machine Co., Waterbury, Ct.
National Machinery Co., Tiffin, O.

HEADING AND SHINGLE MACHINES—

Dubuque Machine Co., Dubuque, Ia.
Peter Gerlach & Co., Cleveland, O.
Wickes Bros., Saginaw, Mich.

HEADLESS BOLTS—See Bolts, Special.**HEAD LIGHTS—See Lights, Head.****HEADS, Clamp—**

R. Bliss Mfg. Co., Pawtucket, R. I.

HEADS, Conductor—

Berger Bros., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.

HEADS, Exhaust—

Benj. F. Kelley & Son, 91 Liberty St., New York.
B. F. Sturtevant Co., Boston, Mass.

HEADS, Indexing and Dividing—

Cincinnati Milling Machine Co., Cincinnati.
Garvin Machine Co., Spring & Varick Sts., New York.
Pratt & Whitney Co., Hartford, Ct.

HEADS, Kitchen Boiler, &c.—

Avery Stamping Co., Cleveland, O.

HEADS, Planer—

Frankford Steel Co., Ellwood City, Pa.

HEADS, Polishing—

Chandler & Farquhar, Boston, Mass.
Goodell-Pratt Co., Greenfield, Mass.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526 West 25th St., New York.

HEADS, Tank—

W. J. Clark Co., Salem, O.

HEATERS, Barrel, for Coopers—

J. W. Ruger Mfg. Co., Buffalo, N. Y.

HEATERS, Bolt—

U. Baird Machinery Co., Pittsburgh, Pa.

HEATERS, Broiler, Gas and Gasoline—

Schneider & Trenkamp Co., Cleveland, O.

HEATERS, Carriage—

Chicago Flexible Shaft Co., Chicago, Ill.

HEATERS, Curling Iron—

Nicol & Co., Chicago, Ill.

HEATERS, Feed Water—

W. J. Adams, Joliet, Ill.
E. P. Allis Co., Milwaukee, Wis.
Bates Machine Co., Joliet, Ill.
Harrisburg Pipe Bending Co., Harrisburg, Pa.
Harrison Safety Boiler Works, Philadelphia, Pa.
Heat Transmission Co., Danbury, Ct.
F. W. Iredell, 26 Cortlandt St., New York.
Benj. F. Kelley & Son, 91 Liberty St., New York.
John H. McGowan Co., Cincinnati, O.
National Pipe Bending Co., New Haven, Ct.
Frank L. Patterson, 139 Liberty St., New York.
Taunton Locomotive Mfg. Co., Ltd., Taunton, Mass.
Frank Toomey, Philadelphia, Pa.
Warren Webster & Co., Camden, N. J.
Robt. Wetherill & Co., Chester, Pa.
W. W. Whitehead, Davenport, Iowa.
Whitlock Coil Pipe Co., Elmwood, Ct.
Wickes Bros., Saginaw, Mich.

HEATERS, Fire—

Pedrick & Ayer Co., Philadelphia, Pa.

HEATERS, Gas, Gasoline and Oil—

Wm. M. Crane Co., 1131 Broadway, N. Y.
Gilbert & Bennett Mfg. Co., 42 CHM st., New York.
Hollands Mfg. Co., Erie, Pa.
Edward Miller & Co., Meriden, Ct.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Schneider & Trenkamp Co., Cleveland, O.

HEATERS, Glue—

J. W. Paxson Co., Philadelphia, Pa.

HEATERS, House—

Exeter Machine Works, Exeter, N. H.
J. H. McLain Co., Canton, O.
National Pipe Bending Co., New Haven, Ct.
West Side Foundry Co., Troy, N. Y.

**HEATERS, LAMP CHIMNEY, WIRE—
See Household Articles, Wire.****HEATERS, Sad Iron—**

Enterprise Mfg. Co., Philadelphia, Pa.
Schneider & Trenkamp Co., Cleveland, O.
Van Wagoner & Williams Hardware Co., Cleveland, O.
A. C. Williams, Ravenna, O.

HEATERS, Tank—

Flint & Waring Mfg. Co., Kendallville, Ind.
Janessville Hay Tool Co., Janessville, Wis.
Sandwich Enterprise Co., Sandwich, Ill.

HEATING AND VENTILATING APPARATUS—

American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Exeter Machine Works, Exeter, N. H.
H. C. Fish Machine Works, Worcester, Mass.
Harrison Safety Boiler Works, Philadelphia, Pa.
Howard & Morse, 45 Fulton St., New York.
John H. McGowan Co., Cincinnati, O.
New York Blower Co., 39 Cortlandt St., New York.
B. F. Sturtevant Co., Boston, Mass.
Warren Webster & Co., Philadelphia, Pa.

HEEL CHAINS, PLATES, STIFFENERS—See Chains, Plates, Stiffeners.**HIDE BOUND MALLET—See Mallets, Raw Hide and Hide Bound.****HIDE FACED HAMMERS—See Hammers, Raw Hide and Hide Faced.****HIDE ROPE—See Rope, Hide.****HINGE HASPS, NAILS, PLATES—See Hasps, Nails, Plates.****HINGE MACHINERY, Automatic—**

Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

HINGES AND HASPS, Box, Crate, &c.—

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.
Stanley Works, New Britain, Ct.

HINGES AND HASPS, Box, Crate, &c.—

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.
Stanley Works, New Britain, Ct.

HINGES, Blind—

Palmer Hardware Mfg. Co., Troy, N. Y.
Charles Parker Co., Meriden, Ct.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Stanley Works, New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.
Wire Goods Co., Worcester, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.

HINGES, Brass—

Arcade Mfg. Co., Freeport, Ill.
Norwalk Lock Co., South Norwalk, Ct.
Stanley Works, New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.

HINGES, BRASS, BRONZE, &c.—See Butts and Hinges, Brass, Bronze, &c.**HINGES, Coach and Carriage—**

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

HINGES, Folding Bed—

Wheeling Hinge Co., Wheeling, W. Va.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

HINGES, Gate—

John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Charles Parker Co., Meriden, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Wrightsville Hardware Co., Wrightsville, Pa.

HINGES, Long Chest—

Stanley Works, New Britain, Ct.
Wheeling Hinge Co., Wheeling, W. Va.

HINGES, Malleable Iron—

W. & J. Tiebout, 118 Chambers St., N. Y.

HINGES, Plate—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Works, New Britain, Ct.

HINGES, Refrigerator—

Reading Hardware Co., Reading, Pa.
Stanley Works, New Britain, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.

HINGES, Screw Hook or Strap, and Eye—

McKinney Mfg. Co., Allegheny, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Wheeling Hinge Co., Wheeling, W. Va.

HINGES, Shutter—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Wrightsville Hardware Co., Wrightsville, Pa.

HINGES, Spring—

Arcade Mfg. Co., Freeport, Ill.
J. Bardsley, 147-151 Baxter St., N. Y.
Bommer Bros., Brooklyn, N. Y.
Chantrell Tool Co., Reading, Pa.
Chicago Spring Butt Co., Chicago, Ill.
Coleman Hardware Co., Chicago, Ill.
Easy Spring Hinge Co., Shelby, O.
John C. Kupferle, St. Louis, Mo.
Lawson Mfg. Co., Milwaukee, Wis.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Pullman Sash Balance Co., Rochester, N. Y.
Reading Hardware Co., Reading, Pa.
Scovill Mfg. Co., Waterbury, Ct.
Stover Mfg. Co., Freeport, Ill.
Union Mfg. Co., New Britain, Ct.
Van Wagoner & Williams Hardware Co., Cleveland, O.

HINGES, Strap and T, &c.—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Jenkins Iron & Tool Co., Howard, Pa.
F. E. Kohler & Co., Canton, O.
Lawrence Bros., Sterling, Ill.
McKinney Mfg. Co., Allegheny, Pa.
Stanley Works, New Britain, Ct.
Wheeling Hinge Co., Wheeling, W. Va.

HINGES, Strap and T, Corrugated—

Stanley Works, New Britain, Ct.

HINGES, Trap Door—

Stanley Works, New Britain, Ct.
Wheeling Hinge Co., Wheeling, W. Va.

HINGES, Trunk—

McKinney Mfg. Co., Allegheny, Pa.
Stanley Works, New Britain, Ct.

HINGES, Water Closet Seat—

Reading Hardware Co., Reading, Pa.
Stanley Works, New Britain, Ct.
Van Wagoner & Williams Hardware Co., Cleveland, O.

HITCHES, Rope—

F. E. Myers & Bro., Ashland, O.

HITCHING HOOKS, POSTS, RINGS, ROPES, WEIGHTS—See Hooks, Posts, Rings, Ropes, Weights.**HITCHING POST RODS—**

Wm. Bayley & Sons Co., Milwaukee, Wis.
Covert Mfg. Co., West Troy, N. Y.

HITCHING POST TOPS—See Post Tops, Hitching.**HITCHING STRAP ADJUSTERS—See Adjusters, Hammock Rope and Hitching Strap.****HOBBLE CHAINS—See Chains, Hobbles.****HOBS, Worm—**

Brown & Sharpe Mfg. Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.

HODS, Coal—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

HODS, Mortar, Brick, &c.—

J. R. Clark Co., Minneapolis, Minn.

HOE BRACKETS—See Brackets, Hoe.**HOE MACHINERY—See Fork, Rake and Hoe Machinery.**

HOES, Garden, Field, Mortar, &c.—

Chantrell Tool Co., Reading, Pa.
Ely Hoe & Fork Co., St. Johnsbury, Vt.
Peter Gerlach & Co., Cleveland, O.
Iowa Farming Tool Co., Fort Madison, Ia.
Jenkins Iron & Tool Co., Howard, Pa.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

HOES, Grape—

Syracuse Chilled Plow Co., Syracuse, N. Y.

HOES, Scuffle—

Ely Hoe & Fork Co., St. Johnsbury, Vt.
Iowa Farming Tool Co., Fort Madison, Ia.
Withington & Cooley Mfg. Co., Jackson, Mich.

HOG RINGS, RINGERS—See Rings and Ringers, Hog.**HOG SCRAPERS, TONGS—See Scrapers, Tongs.****HOISTING ENGINES—See Engines, Hoisting.****HOISTING MACHINES—**

U. Baird Machinery Co., Pittsburgh, Pa.
Alfred Box & Co., Philadelphia, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Thos. Carlin's Sons Allegheny, Pa.
Chisholm & Moore Mfg. Co., Cleveland, O.
Cleveland Crane & Car Co., Cleveland, O.
James P. Dunn, Cleveland, O.
Eastern Machinery Co., New Haven, Ct.
Edward J. Etting, Philadelphia, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Hill, Clarke & Co., Boston, Mass.
Jeffrey Mfg. Co., Columbus, O.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Niles Tool Works Co., Hamilton, O.
F. R. Patch Mfg. Co., Rutland, Vt.
A. B. Pitkin Machinery Co., Providence, R. I.
Reading Crane & Hoist Works, Reading, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
J. S. Spedel, Reading, Pa.
Warner Elevator Mfg. Co., Cincinnati, O.
R. D. Wood & Co., Philadelphia, Pa.

HOISTS, Brick and Mortar—

Thos. Carlin's Sons, Allegheny, Pa.

HOISTS, Chain and Rope—

Allegheny Machine Co., Allegheny, Pa.
Boston & Lockport Block Co., Boston, Mass.
Alfred Box & Co., Philadelphia, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland, O.
James P. Dunn, Cleveland, O.
Chas. G. Eckstein & Co., 249 Center St., New York.
Fulton Iron & Engine Works, Detroit, Mich.
E. Harrington Son & Co., Philadelphia, Pa.
Hill, Clarke & Co., Boston, Mass.
Lane Brothers Co., Poughkeepsie, N. Y.
Jos. F. McCoy Co., 26 Warren St., N. Y.
Ney Mfg. Co., Canton, O.
Niles Tool Works Co., Hamilton, O.
Reading Crane & Hoist Works, Reading, Pa.
J. G. Spedel, Reading, Pa.

HOISTS, Electric—

Cleveland Crane & Car Co., Cleveland, O.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
Northern Engineering Works, Detroit, Mich.

HOISTS, Hand—

Allegheny Machine Co., Allegheny, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. G. Spedel, Reading, Pa.

HOISTS, Hydraulic—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

HOISTS, Pneumatic—

Chicago Pneumatic Tool Co., Chicago, Ill.
Chisholm & Moore Mfg. Co., Cleveland, O.
Nazel & Bassett, Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Northern Engineering Works, Detroit, Mich.
Pedrick & Ayer Co., Philadelphia, Pa.
Pneumatic Crane Co., Pittsburgh, Pa.
Rand Drill Co., 100 Broadway, New York.
Craig Ridgway & Son Co., Coatesville, Pa.
Standard Pneumatic Tool Co., Chicago, Ill.
Stow Flexible Shaft Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

HOISTS, Portable—

Alfred Box & Co., Philadelphia, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Thos. Carlin's Sons, Allegheny, Pa.
Chicago Pneumatic Tool Co., Chicago, Ill.
Cleveland Crane & Car Co., Cleveland, O.
James P. Dunn, Cleveland, O.
Niles Tool Works Co., Hamilton, O.
Pedrick & Ayer Co., Philadelphia, Pa.
Craig Ridgway & Son Co., Coatesville, Pa.
Stow Flexible Shaft Co., Philadelphia, Pa.

HOISTS, Riveter—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

HOISTS, Sidewalk—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
J. G. Spedel, Reading, Pa.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati, O.

HOISTS, Trolley—

Chisholm & Moore Mfg. Co., Cleveland, O.
Henry B. Newhall, 26 Cortlandt St., N. Y.

HOISTS, Worm—

Jones & Laughlins, Ltd., Pittsburgh, Pa.

HOLDERS AND CUTTERS, Roll Paper—

N. R. Streeter & Co., Rochester, N. Y.

HOLDERS, Bag—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.
N. R. Streeter & Co., Rochester, N. Y.

HOLDERS, Bit, Brace, Die—

Butterfield & Co., Derby Line, Vt.
Pratt & Whitney Co., Hartford, Ct.

HOLDERS, Blacking Box—

Wrightsville Hardware Co., Wrightsville, Pa.

HOLDERS, Broom—

Nicol & Co., Chicago, Ill.
Sam'l C. Tatum Co., Cincinnati, O.
A. C. Williams, Ravenna, O.

HOLDERS, BROOM, BRUSH, COMB, SOAP, WIRE—See Household Articles, Wire.**HOLDERS, Cabinet Scraper—**

Geo. H. Bishop & Co., Lawrenceburg, Ind.

HOLDERS, Card—

Edward Darby & Sons, Philadelphia, Pa.
Logan & Strobridge Iron Co., New Brighton, Pa.
Stanley Works, New Britain, Ct.

HOLDERS, Champagne Bottle, Silver Plated.

International Silver Co., 9-13 Malden Lane, New York.

HOLDERS, Christmas Tree—

Logan & Strobridge Iron Co., New Brighton, Pa.
North Bros. Mfg. Co., Philadelphia, Pa.

HOLDERS, Dictionary—

Stover Mfg. Co., Freeport, Ill.

HOLDERS, Die—

Braunsdorf-Mueller Co., Elizabeth, N. J.
S. W. Card Mfg. Co., Mansfield, Mass.
Pratt & Whitney Co., Hartford, Ct.
E. F. Reece Co., Greenfield, Mass.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

HOLDERS, Divider Pencil—

Bemis & Call Hardware & Tool Co., Springfield, Mass.

HOLDERS, Door—

Brohard & Co., Philadelphia, Pa.
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.
Reading Hardware Co., Reading, Pa.
Wilcox Mfg. Co., Aurora, Ill.

HOLDERS, Drill and Tap—

Chandler & Farquhar, Boston, Mass.
Cleveland Twist Drill Co., Cleveland, O.
Ideal Machine Works, Hartford, Ct.
A. D. Quint, Hartford, Ct.
Pratt & Whitney Co., Hartford, Ct.
E. F. Reece Co., Greenfield, Mass.

HOLDERS, Extension Bit and Screw Driver—

Millers Falls Co., 28 Warren St., New York.

HOLDERS, Flagstaff—

Enterprise Mfg. Co., Philadelphia, Pa.
Nicol & Co., Chicago, Ill.

HOLDERS, Gas—

R. D. Wood & Co., Philadelphia, Pa.

HOLDERS, Glasses—

Fred. J. Meyers Mfg. Co., Hamilton, O.

HOLDERS, HOSE—See Hose Attachments.**HOLDERS, Key—**

Ames Sword Co., Chicopee, Mass.

HOLDERS, Knurl—

Braunsdorf-Mueller Co., Elizabeth, N. J.

HOLDERS, Lantern—

W. C. Ladd, Bristol, Ct.

HOLDERS, Match and Match Box—

Taplin Mfg. Co., Forestville, Ct.

HOLDERS, Micrometer—

Chandler & Farquhar, Boston, Mass.

HOLDERS, Nipple—

Armstrong Mfg. Co., Bridgeport, Ct.
Curtis & Curtis, Bridgeport, Ct.
Wiley & Russell Mfg. Co., Greenfield, Mass.

HOLDERS, Oil Stone—

American Machinery Co., Grand Rapids, Mich.
Pike Mfg. Co., Pike Station, N. H.

HOLDERS, Paper Bag—

Nicol & Co., Chicago, Ill.
Sam'l C. Tatum Co., Cincinnati, O.

HOLDERS, Pump Pipe—

Red Jacket Mfg. Co., Davenport, Ia.

HOLDERS, Reamer—

Billings & Spencer Co., Hartford, Ct.

HOLDERS, Rope—

J. D. Warren Mfg. Co., Chicago, Ill.

HOLDERS, Rubber Stamp—

R. Woodman Mfg. & Supply Co., Boston.

HOLDERS, Sample—

Fred. J. Meyers Mfg. Co., Hamilton, O.
J. D. Warren Mfg. Co., Chicago, Ill.

HOLDERS, Sash—

Lawrence Bros., Sterling, Ill.
Norwalk Lock Co., South Norwalk, Ct.

HOLDERS, Spoon, Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.

HOLDERS, Stake, Wagon—

Louden Machinery Co., Fairfield, Ia.
Stanley Works, New Britain, Ct.

HOLDERS, Stenographers' Copy—

Sam'l C. Tatum Co., Cincinnati, O.

HOLDERS, Test Tube—

United States Clothes Pin Co., Montpelier, Vt.

HOLDERS, Tire Bolt—

Wiley & Russell Mfg. Co., Greenfield, Mass.

HOLDERS, Toilet Paper—

Crescent Brass & Iron Co., Detroit, Mich.
Erie Specialty Co., Erie, Pa.
N. R. Streeter & Co., Rochester, N. Y.

HOLDERS, Tool—

Billings & Spencer Co., Hartford, Ct.

HOLDERS, Towel—

Crescent Brass & Iron Co., Detroit, Mich.

HOLDERS, Twine—

N. R. Streeter & Co., Rochester, N. Y.

HOLDERS, Wire Cloth—

Ossawan Mills Co., Norwich, Ct.

HOLLOW AUGERS, DRILLS, &c.—See Augers, Drills, &c.**HOLLOW WARE—See Ware, Hollow, Silver Plated, Steel, &c.****HONES, Carborundum—**

Carborundum Co., Niagara Falls, N. Y.

HONES, Razor—

Pike Mfg. Co., Pike Station, N. H.

HOOF KNIVES—See Knives, Farriers'.**HOOK AND EYE MACHINERY—**

Blake & Johnson, Waterbury, Ct.
E. J. Manville Machine Co., Waterbury, Ct.
A. H. Nilson Machine Co., Bridgeport, Ct.

HOOK HEAD BOLTS—See Bolts, Special.**HOOKS AND EYES, Malleable—**

E. Jenckes Mfg. Co., Pawtucket, R. I.

HOOKS AND EYES, Screw—See Wire Goods, Bright.**HOOKS AND THIMBLES—**

W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Awning—

W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.

HOOKS, Bale, Box, Hoghead, &c.—

W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Beam—

Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

HOOKS, Belt—

Bristol Co., Waterbury, Ct.
E. Jenckes Mfg. Co., Pawtucket, R. I.
W. O. Talcott, Providence, R. I.
Wire Goods Co., Worcester, Mass.

HOOKS, Bench—See Stops, Bench.**HOOKS, Bird Cage—**

Edward Darby & Sons, Philadelphia, Pa.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
Wrightsville Hardware Co., Wrightsville, Pa.

HOOKS, Boat—

W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Box and Cotton—

Braunsdorf-Mueller Co., Elizabeth, N. J.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Nicol & Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

HOOKS, Brine—

Wire Goods Co., Worcester, Mass.

HOOKS, Bush—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

HOOKS, Button—

Star Heel Plate Co., Newark, N. J.

HOOKS, Cant—

Boston & Lockport Block Co., Boston.
Keystone Drop Forge Co., Philadelphia, Pa.

HOOKS, Chandelier or Lamp—

Arcade Mfg. Co., Freeport, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
A. C. Williams, Ravenna, O.
Wire Goods Co., Worcester, Mass.

HOOKS, Clam—

Ely Hoe & Fork Co., St. Johnsbury, Vt.
Iowa Farming Tool Co., Fort Madison, Ia.
Withington & Cooley Mfg. Co., Jackson, Mich.

HOOKS, Clothes Line—

Logan & Strobbridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
Wrightsville Hardware Co., Wrightsville, Pa.

HOOKS, Coat, Hat, &c.—

Atlas Mfg. Co., New Haven, Ct.
Coleman Hardware Co., Chicago, Ill.
Crescent Brass & Iron Co., Detroit, Mich.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
W. & J. Tiebout, 118 Chambers St., N. Y.
Van Wagoner & Williams Hardware Co., Cleveland, O.
A. C. Williams, Ravenna, O.
Wire Goods Co., Worcester, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.

HOOKS, Conductor—

Berger Bros., Philadelphia, Pa.
Clark, Quilen & Morse, Peoria, Ill.
Garry Iron & Steel Roofing Co., Cleveland, O.

HOOKS, Corn and Tobacco—

Clark & Parsons Co., East Wilton, Me.
Iowa Farming Tool Co., Fort Madison, Ia.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.
Withington & Cooley Mfg. Co., Jackson, Mich.

HOOKS, Cup and Shoulder—

M. S. Brooks & Sons, Chester, Ct.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Drive—

E. Jenckes Mfg. Co., Pawtucket, R. I.

HOOKS, S and S—

Bridgeport Chain Co., Bridgeport, Ct.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Smith & Egge Mfg. Co., Bridgeport, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Floor Pulley—

Janesville Hay Tool Co., Janesville, Wis.
Louden Machinery Co., Fairfield, Ia.
F. E. Myers & Bro., Ashland, O.
Ney Mfg. Co., Canton, O.
Red Jacket Mfg. Co., Davenport, Ia.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

HOOKS, Gaff Topsail—

W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Gate and Door—

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

HOOKS, Grass—

W. C. Heller & Co., Montclair, N. J.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

HOOKS, Hammock—

M. S. Brooks & Sons, Chester, Ct.
Keystone Drop Forge Co., Philadelphia, Pa.
I. E. Palmer, Middletown, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
Wire Goods Co., Worcester, Mass.

HOOKS, Harness—

Arcade Mfg. Co., Freeport, Ill.
Billings & Spencer Co., Hartford, Ct.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

HOOKS, Hitching—

Wire Goods Co., Worcester, Mass.

HOOKS, Hoist and Crane—

Keystone Drop Forge Co., Philadelphia.

HOOKS, Horse Feet—

Concord Axle Co., Penacook, N. H.

HOOKS, ICE—See Ice Harvesting Tools.**HOOKS, Jamb—**

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

HOOKS, Lug, Swamp, &c.—

Peter Gerlach & Co., Cleveland, O.

HOOKS, Meat—

M. S. Brooks & Sons, Chester, Ct.
Enterprise Mfg. Co., Philadelphia, Pa.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Wheeling Hinge Co., Wheeling, W. Va.
Wire Goods Co., Worcester, Mass.

HOOKS, Overhead, Carrying Track—

F. E. Myers & Bro., Ashland, O.
Red Jacket Mfg. Co., Davenport, Ia.

HOOKS, Peavey—

Peter Gerlach & Co., Cleveland, O.

HOOKS, Picture—

M. S. Brooks & Sons, Chester, Ct.
Ossawan Mills Co., Norwich, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.

HOOKS, Pipe—

Berger Bros. Co., Philadelphia, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

HOOKS, Potato, Manure, &c.—

Iowa Farming Tool Co., Fort Madison, Ia.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

HOOKS, Seat Spring—

Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.

HOOKS, Sign, Joint, &c.—

Wheeling Hinge Co., Wheeling, W. Va.

HOOKS, Single Tree Safety—

J. N. Reimers, Davenport, Ia.

HOOKS, Socket—

I. S. Spencer's Sons, Guilford, Ct.

HOOKS, STAPLE, &c.—See Wrought Iron Goods.**HOOKS, Ticket—**

Wire Goods Co., Worcester, Mass.

HOOKS, Weeding—

F. E. Kohler & Co., Canton, O.
Palmer Hardware Mfg. Co., Troy, N. Y.

HOOKS, Whistle Cord—

American Railway Supply Co., 24 Park Place, New York.

HOOP BRASS CLASPS—See Brass Clasps.**HOOP MACHINES, Barrel—**

Defiance Machine Works, Defiance, O.

HOOPS AND BANDS—

American Steel Hoop Co., Pittsburgh, Pa.
Consolidated Iron & Steel Co., Bristol, Pa.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
John B. Newkirk & Co., Philadelphia, Pa.
Ogden & Wallace, 577 Greenwich St., N. Y.
Pierson & Co., 29 Broadway, New York.
Horace T. Potts & Co., Philadelphia, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.

HOOPS, Tub—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

HOOPS, Wire, Barrel and Keg—

American Steel & Wire Co., Chicago, Ill.

HORNS, Fog—

Edson Mfg. Co., Boston, Mass.

HORNS, Shoe, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

HORSE BRUSHES, CLIPPERS, &c.—See Brushes, Clippers, &c.

- HORSE HAY FORKS**—See Hayfork Tools.
- HORSE POWERS**—
Thomas Carlin's Sons, Allegheny, Pa.
Famous Mfg. Co., Chicago, Ill.
- HORSE RADISH GRATERS**—See Graters, Horse Radish, &c.
- HORSESHOE CALKS**—See Calks, Horseshoe.
- HORSESHOE NAIL IRON**—See Iron, Horseshoe Nail.
- HORSESHOERS' VISES**—See Vises, Horseshoers'.
- HORSE TOOTH RASPS**—See Rasps, Horse Tooth.
- HORSES, Masons'**—
Portland Ladder Co., Newark, N. J.
- HOSE, Air Tool**—
Chicago Pneumatic Tool Co., Chicago, Ill.
Pedrick & Ayer Co., Philadelphia, Pa.
Peerless Rubber Mfg. Co., 16 Warren St., New York.
- HOSE ATTACHMENTS (Menders, Couplings, Bands, Holders, Reducers, Clamps, Caps, &c.)**—
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
W. J. Clark Co., Salem, O.
Crescent Brass & Iron Co., Detroit, Mich.
Edson Mfg. Co., Boston, Mass.
F. E. Kohler & Co., Canton, O.
John C. Kupferle, St. Louis, Mo.
McNab & Harlin Mfg. Co., 56 John St.,
Pleuger & Henger Mfg. Co., St. Louis, Mo.
- HOSE, Cotton**—
Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.
- HOSE, Linen**—
Boston Belting Co., Boston, Mass.
- HOSE REELS**—See Reels, Hose.
- HOSE, Rubber**—
Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.
- HOT AIR COOK PANS**—See Pans, Cook, Hot Air.
- HOTEL AND RESTAURANT COOKING APPARATUS (Stock Boilers, Roasting Ovens, Vegetable Boilers and Steamers, Oyster Stewers, Furnace and Caldron, &c.)**—
V. Clad & Sons, Philadelphia, Pa.
- HOT HOUSE PULLEYS**—See Pulleys, Hot House.
- HOT PLATES**—See Plates, Hot.
- HOUD PLATES**—See Plates, Hound.
- HOUSE BELLS, HEATERS, NUMBERS**—See Bells, Heaters, Letters.
- HOUSEHOLD ARTICLES, Wire (Sponge Baskets, Dish Covers, Easels, Plate Handlers, Lamp Chimney Heaters, Broom Holders, Brush and Comb Holders, Soap Holders, Table Mats, Meat Rests, Shirt Rests, Stove Pipe Shelves, Soap Dishes and Brackets, Coffee Pot Stands, Tea and Coffee Pot Strainers)**—
Bicknell Hardware Co., Janesville, Wis.
Edward Darby & Sons, Philadelphia, Pa.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Nelson Lyon, Albany, N. Y.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Wickwire Bros., Cortland, N. Y.
Wire Goods Co., Worcester, Mass.
- HOUSES, Wire Summer**—
Fred. J. Meyers Mfg. Co., Hamilton, O.
- HUB BORING MACHINES**—
Defiance Machine Works, Defiance, O.
Silver Mfg. Co., Salem, O.
- HUB MACHINES, Bicycle**—
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts., New York.
Pratt & Whitney Co., Hartford, Ct.
- HUBS, Bicycle**—
American Tool Works Co., Cincinnati, O.
Garvin Machine Co., Spring & Varick Sts., New York.
New Britain Hardware Mfg. Co., New Britain, Ct.
- HUSKERS, PINS AND GLOVES**—
John H. Graham & Co., 113 Chambers St., New York.
- HYDRANT CHAIN**—See Chain, Hydrant.
- HYDRANTS AND STREET WASHERS**—
Chapman Valve Mfg. Co., Boston, Mass.
Deming Co., Salem, O.
Flint & Walling Mfg. Co., Kendallville, Ind.
Kennedy Valve Mfg. Co., 58 Beekman St., New York.
John C. Kupferle, St. Louis, Mo.
McNab & Harlin Mfg. Co., 56 John St., New York.
F. E. Myers & Bro., Ashland, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Foundry Co., Reading, Pa.
R. D. Wood & Co., Philadelphia, Pa.
- HYDRAULIC ACCUMULATORS, CRANES, &c.**—See Accumulators, Cranes, &c.
- HYDRAULIC MACHINERY**—
Henry Alken, Pittsburgh, Pa.
Lloyd Booth Co., Youngstown, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Diamond Drill & Machine Co., Birdsboro, Pa.
S. V. Huber & Co., Pittsburgh, Pa.
Julian Kennedy, Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Niles Tool Works Co., Hamilton, O.
Pennsylvania Engineering Works, New Castle, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia.
R. S. Smythe Co., Pittsburgh, Pa.
Wm. Tod & Co., Youngstown, O.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Watson-Stillman Co., 204-210 East 43d St., New York.
Wickes Bros., Saginaw, Mich.
R. D. Wood & Co., Philadelphia, Pa.
- HYDRO-CARBON LAMPS**—See Lamps, Gasoline Gas.
- ICE AXES, BARS, &c.**—See Axes, Bars, &c.
- ICE BOWLS**—See Bowls, Silver Plated.
- ICE CHESTS**—See Refrigerators and Ice Chests.
- ICE CREAM DISHERS**—See Dishers, Ice Cream.
- ICE CREAM MAKERS' MACHINERY AND SUPPLIES (Ice Breakers, Packing Cans, Shipping Buckets, Blocks and Moulds, Spoons, Strainers, &c.)**—
V. Clad & Sons, Philadelphia, Pa.
- ICE HARVESTING TOOLS (Angers, Breakers, Chisels, Forks, Bars, Grapples, Hooks, Markers, Measuring Irons, Planes, Plows, House and Car Runs, Saws, Shavers, Scrapers, Adzes and Scoop Nets)**—
Henry Disston & Sons, Philadelphia, Pa.
Peter Gerlach & Co., Cleveland, O.
Wm. T. Wood & Co., Arlington, Mass.
- ICE MACHINERY**—
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
York Mfg. Co., York, Pa.
- IMPLEMENTS, GUN**—See Gun Implements.
- IMPLEMENT WHEELS**—See Wheels, Implement.
- IMPORTERS, HARDWARE AND CUTLERY**—
Hermann Boker & Co., 101 Duane St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.
- IMPORTERS, Pocket Cutlery, Razors, Scissors and Table Cutlery.**—
Hermann Boker & Co., 101 Duane St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.
- INCANDESCENT LAMPS**—See Lamps, Incandescent.
- INCLINOMETERS**—
L. S. Starrett Co., Athol, Mass.
- INDEXES, Card**—
Globe-Wernicke Co., Cincinnati, O.
- INDEXING HEADS**—See Heads, Indexing and Dividing.
- INDEX PLATES FOR GEAR CUTTING**—
Glenson Tool Co., Rochester, N. Y.
- INDEX PLATES, For Gear Cutting Machines**—
Brown & Sharpe Mfg. Co., Providence, R. I.
- INDEX PLATES, For Milling Machines.**—
Brown & Sharpe Mfg. Co., Providence, R. I.
- INDIAN CLUBS**—See Clubs, Indian.
- INDICATORS, Center**—
J. T. Slocumb & Co., Providence, R. I.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
- INDICATORS, Speed**—
Edward Brown, Philadelphia, Pa.
W. N. Durant, Milwaukee, Wis.
Manning, Maxwell & Moore, 85 Liberty St., New York.
A. B. Pitkin Machinery Co., Providence, R. I.
Simonds Mfg. Co., Fitchburg, Mass.
L. S. Starrett Co., Athol, Mass.
Tanite Co., Stroudsburg, Pa.
R. Woodman Mfg. & Supply Co., Boston, Mass.
- INDICATORS, Steam Engine**—
Ashton Valve Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.
- INJECTORS, Boiler**—
Jenkins Bros., 71 John St., New York.
Lunkenheimer Company, Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St., New York.
William Sellers & Co. (Inc.), Philadelphia.
Frank Toomey, Philadelphia, Pa.
N. A. Watson, Erie, Pa.
- INKSTANDS**—See Stationers' Hardware.
- INKSTANDS, SILVER PLATED**—See Desk Specialties.
- INSECT POWDER GUNS**—See Guns, Insect Powder.
- INSPECTION AND INSURANCE, Steam Boiler**—
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Ct.
- INSPECTORS' SCALES, LEATHER**—See Scales, Leather Inspectors'.
- INSPIRATORS**—See Injectors, Boiler.
- INSTRUMENTS, Leveling and Squaring**—
Athol Machine Co., Athol, Mass.
L. S. Starrett Co., Athol, Mass.
- INSULATING MACHINERY FOR WIRE**—
Farrel Foundry & Mach. Co., Ansonia, Ct.
- INSULATORS, Gas and Electric Fixtures.**—
Stanley G. Flagg & Co., Philadelphia, Pa.
- INSULATORS, Trolley**—
Billings & Spencer Co., Hartford, Ct.
General Electric Co., Schenectady, N. Y.
- INSURANCE, Steam Boiler**—
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Ct.
- INTERFERING BOOTS**—See Boots, Interfering.
- IRON AND BRASS, Ornamental (Grilles, Gates, Crestings, Finials, Window Guards, Vanes, Wickets, &c.)**—
W. J. Adams, Joliet, Ill.
E. T. Barnum, Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Belmont Iron Works, Philadelphia, Pa.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Crescent Brass & Iron Co., Detroit, Mich.
Edward Darby & Sons, Philadelphia, Pa.
Dow Wire Works Co., Louisville, Ky.
Ellis & Halfenbarger, Indianapolis, Ind.
Estey Wire Works Co., 65 Fulton St., N. Y.
Forest City Steel & Iron Co., Cleveland, O.

Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Howard & Morse, 45 Fulton St., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Murdoch Parlor Grate Co., Boston, Mass.
National Iron & Brass Co., Cleveland, O.
New England Structural Co., Boston, Mass.
Henry B. Newhall, 26 Cortlandt St., N. Y.
Scheeler's Sons, Buffalo, N. Y.
Stewart Iron Works, Cincinnati, O.
W. S. Tyler Co., Cleveland, O.
Up-to-Date Mfg. Co., Terre Haute, Ind.
Van Dorn Iron Works Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

IRON AND BRASS STUDS—See Studs, Brass and Iron.

IRON AND STEEL, Brokers and Merchants—

Reed F. Blair & Co., Pittsburgh, Pa.
M. J. & M. Blake, 79 10th Ave., N. Y.
Bole Ross & Co., Pittsburgh, Pa.
Cabeen & Co., Philadelphia, Pa.
Chicago House Wrecking Co., Chicago, Ill.
Barclay W. Cotton & Co., Philadelphia.
Justice Cox, Jr., Philadelphia, Pa.
R. M. Cunliffe, Philadelphia, Pa.
J. K. Dimmick & Co., Philadelphia, Pa.
Edw. J. Etting, Philadelphia, Pa.
F. Greiner, Philadelphia, Pa.
Arthur C. Harvey Co., Boston, Mass.
J. W. Hoffman & Co., Philadelphia, Pa.
C. B. Houston & Co., Philadelphia, Pa.
Hyde Brothers & Co., Pittsburgh, Pa.
Jerome Keeley & Co., Philadelphia, Pa.
J. Tatnall Lea & Co., Philadelphia, Pa.
John Leonard & Co., 220 Broadway, N. Y.
Henry Lewis & Co., Philadelphia, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
Chas. E. McInnes & Co., Pittsburgh, Pa.
A. Milne & Co., 1 Broadway, New York.
J. J. Mohr, Philadelphia, Pa.
Geo. Nash & Co., Chicago, Ill.
Nicolls, Wheeler & Co., Philadelphia, Pa.
Ogden & Wallace, 577 Greenwich St., N. Y.
Pierson & Co., 29 Broadway, New York.
Pilling & Crane, Philadelphia, Pa.
Horace T. Potts & Co., Philadelphia, Pa.
Poulter & Co., Philadelphia, Pa.
J. Wesley Pullman, Philadelphia, Pa.
Frank Samuel, Philadelphia, Pa.
Morton B. Smith, 243 Front St., New York.
E. H. Stroud & Co., Chicago, Ill.
W. H. Thomson & Co., Philadelphia, Pa.
W. H. Wallace & Co., 66 Broadway, N. Y.
E. H. Wilson & Co., Philadelphia, Pa.
Francis Wister, Philadelphia, Pa.
L. & R. Wister & Co., Philadelphia, Pa.

IRON AND STEEL STAIRS—See Stairs, Iron and Steel.

IRON AND STEEL, Swedish—

Arthur C. Harvey Co., Boston, Mass.
W. Lillenberg, 150 Broadway, New York.
A. Milne & Co., 1 Broadway, New York.
Pierson & Co., 29 Broadway, New York.
Horace T. Potts & Co., Philadelphia, Pa.
Wheelock, Lovejoy & Co., 23 Cliff St., New York.

IRON AND STEEL WIRE—See Wire, Iron and Steel, Market, Fence, Stone, &c.

IRON AWNINGS—See Awnings, Iron.

IRON, Axle—

B. M. Jones & Co., Boston, Mass.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

IRON BARS, COLD ROLLED SHEET, CORRUGATED, &c.—See Bars, Corrugated, &c.

IRON BEDSTEADS, LAMPS, &c.—See Bedsteads, Lamps, &c.

IRON, Boiler Brace—

B. M. Jones & Co., Boston, Mass.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

IRON CEILING AND SIDING—See Ceiling and Siding, Iron and Steel.

IRON FAUCETS—See Faucets, Iron.

IRON, Horseshoe—

American Steel Hoop Co., Pittsburgh, Pa.
Consolidated Iron & Steel Co., Bristol, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Pierson & Co., 29 Broadway, New York.
Republic Iron & Steel Co., Chicago, Ill.

IRONING BOARDS, STANDS, TABLES—See Boards, Stands, Tables.

IRON LEVELS—See Levels, Iron, also Plumbs and Levels.

IRON LINE WIRE, Weatherproof—See Wire, Electrical.

IRON MAGAZINES—See Magazines, Iron.

IRON, Merchant Bar—

Jenkins Iron & Tool Co., Howard, Pa.

IRON, Pig—

American Steel Hoop Co., Pittsburgh, Pa.
Ashland Steel Co., Ashland, Ky.
C. R. Baird & Co., Philadelphia, Pa.
Reed F. Blair & Co., Pittsburgh, Pa.
Cabeen & Co., Philadelphia, Pa.
Justice Cox, Jr., Philadelphia, Pa.
Danville Bessemer Co., Danville, Pa.
J. K. Dimmick & Co., Philadelphia, Pa.
Ed. J. Etting, Philadelphia, Pa.
Hickman, Williams & Co., Chicago, Ill.
J. H. Hillman & Son, Pittsburgh, Pa.
J. W. Hoffman & Co., Philadelphia, Pa.
C. B. Houston & Co., Philadelphia, Pa.
Illinois Steel Co., Chicago, Pa.
Jerome Keeley & Co., Philadelphia, Pa.
J. Tatnall Lea & Co., Philadelphia, Pa.
J. J. Mohr, Philadelphia, Pa.
National Steel Co., Battery Park Building, New York.
B. Nicoll & Co., 66 Wall St., New York.
Nicolls, Wheeler & Co., Philadelphia, Pa.
Pilling & Crane, Philadelphia, Pa.
Poinier & Lester, Toledo, O.
J. Wesley Pullman, Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Frank Samuel, Philadelphia, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.
E. H. Stroud & Co., Chicago, Ill.
Tidewater Steel Co., Philadelphia, Pa.
Virginia Iron, Coal & Coke Co., Bristol, Pa.
E. H. Wilson & Co., Philadelphia, Pa.
L. & R. Wister & Co., Philadelphia, Pa.

IRON, Pig, Charcoal—

J. K. Dimmick & Co., Philadelphia, Pa.
J. Wesley Pullman, Philadelphia, Pa.
Superior Charcoal Iron Co., Grand Rapids, Mich.

IRON, Rivet and Stay Bolt—

American Iron & Steel Mfg. Co., Lebanon, Pa.
American Steel Hoop Co., Pittsburgh, Pa.
B. M. Jones & Co., Boston, Mass.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Republic Iron & Steel Co., Chicago, Ill.

IRON ROOFING, ROSETTES—See Roofing, Rosettes.

IRONS, Balling—

Covert Mfg. Co., W. Troy, N. Y.

IRONS, Binding—

Braunsdorf-Mueller Co., Elizabeth, N. J.

IRONS, Calking—

Braunsdorf-Mueller Co., Elizabeth, N. J.
W. & J. Tiebout, 118 Chambers St., N. Y.
L. & I. J. White Co., Buffalo, N. Y.

IRONS, Corner and Brace—

American Hardware Mfg. Co., Ottawa, Ill.
Stanley Works, New Britain, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
Wilcox Mfg. Co., Aurora, Ill.

IRONS, Curling—

Arcade Mfg. Co., Freeport, Ill.
Nicol & Co., Chicago, Ill.

IRONS, Gear—

E. D. Clapp Mfg. Co., Auburn, N. Y.

IRONS, Golf—

J. H. Williams & Co., Brooklyn, N. Y.

IRONS, Grappling—

W. & J. Tiebout, 118 Chambers St., N. Y.

IRONS, MEASURING, ICE—See Ice Harvesting Tools.

IRONS, Pinching—

Arcade Mfg. Co., Freeport, Ill.

IRON, Spindle—

American Steel & Wire Co., Chicago, Ill.

IRONS, Plane—

Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
Stanley Rule & Level Co., New Britain, Ct.
L. & I. J. White Co., Buffalo, N. Y.

IRONS, Porch Post—See Porch Supports.

IRONS, Rub—

John C. Kupferle, St. Louis, Mo.
Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

IRONS, Sash, Laundry, &c.—

Enterprise Mfg. Co., Philadelphia, Pa.
John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Stover Mfg. Co., Freeport, Ill.
N. R. Streeter & Co., Rochester, N. Y.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

IRONS, Sash Cord—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

IRONS, Stake—

Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.

IRONS, Timbale—

Logan & Strobridge Iron Co., New Brighton, Pa.

IRONS, Tynere—

Arcade Mfg. Co., Freeport, Ill.
John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
J. W. Paxson Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Silver A. G. Co., Salem, O.

IRONS, Waffle—

Logan & Strobridge Iron Co., New Brighton, Pa.
Reading Hardware Co., Reading, Pa.
Schneider & Trenkamp Co., Cleveland, O.

IRON WORK BUILDERS—

Belmont Iron Works, Philadelphia, Pa.
J. E. Bolles Iron & Wire Works, Detroit, Mich.

IRON WORK, Builders' (Veranda Columns, Ornamental Porticoes, Coal Holes and Covers, Sidewalk Lights, Area Gratings, Ash Pit Doors, Ventilating Plates, Sash, Skylight Guards)—

E. T. Barnum, Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Belmont Iron Works, Philadelphia, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Forest City Steel & Iron Co., Cleveland, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Hess, Snyder & Co., Massillon, O.
John C. Kupferle, St. Louis, Mo.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
National Iron & Wire Co., Cleveland, O.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Wm. B. Sealife & Sons, Pittsburgh, Pa.
J. H. Sternbergh & Son, Reading, Pa.
Stewart Iron Works, Cincinnati, O.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
Van Dorn Iron Works Co., Cleveland, O.
West Side Foundry Co., Troy, N. Y.

IRRIGATION PUMPS—See Pumps, Irrigation.

IVORY RULES—See Rules, Ivory.

JACK CHAIN, SCREWS—See Chain, Screws.

JACKET PUMPS—See Pumps, Jacket.

JACKS, Boot—

Logan & Strobridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Star Heel Plate Co., Newark, N. J.
Wrightsville Hardware Co., Wrightsville, Pa.

JACKS, Carriage and Wagon—

Arcade Mfg. Co., Freeport, Ill.
Boston & Lockport Block Co., Philadelphia.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.

- Lane Bros. Co., Poughkeepsie, N. Y.
 Millers Falls Co., 28 Warren St., New York.
 Nicol & Co., Chicago, Ill.
 Silver Mfg. Co., Salem, O.
 Walter W. Woodruff & Sons Co., Mount Carmel, Ct.
- JACKS, Hydraulic—**
 Dienelt & Eisenhardt, Philadelphia, Pa.
 Richard Dudgeon, 24 Columbia St., N. Y.
 Fairbanks Co., 311 Broadway, New York.
 Jos. F. McCoy Co., 26 Warren St., N. Y.
 Watson-Stillman Co., 204-210 East 43d St., New York.
- JACKS, Log—**
 Buhl Malleable Co., Detroit, Mich.
 Jeffrey Mfg. Co., Columbus, O.
 Link-Belt Engineering Co., Philadelphia.
 Wickes Bros., Saginaw, Mich.
- JACKS, Screw—**
 Cleveland City Forge & Iron Co., Cleveland, O.
 Fairbanks Co., 311 Broadway, New York.
 Wm. G. Le Count, South Norwalk, Ct.
 Jos. F. McCoy Co., 26 Warren St., N. Y.
 Millers Falls Co., 28 Warren St., New York.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 L. S. Starrett Co., Athol, Mass.
 Watson-Stillman Co., 204-210 East 43d St., New York.
- JACKS, Speed—**
 J. K. Wilder & Sons, Monroe, Mich.
- JACKS, Timber—See Timber Dollies.**
- JAILS, JAIL CELLS, &c.—**
 W. J. Adams, Joliet, Ill.
 E. T. Barnum, Detroit, Mich.
 Wm. Bayley Sons & Co., Milwaukee, Wis.
 J. E. Bolles Iron & Wire Works, Detroit, Mich.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 National Iron & Wire Co., Cleveland, O.
 Stewart Iron Works, Cincinnati, O.
 Van Dorn Iron Works Co., Cleveland, O.
- JAMB HOOKS—See Hooks, Jamb.**
- JAPAN, Baking—**
 Standard Varnish Works, 29 Broadway, New York.
- JAPANING—**
 Albany Foundry Co., Albany, N. Y.
 Avery Stamping Co., Cleveland, O.
 Forest City Foundry & Mfg. Co., Cleveland, O.
 J. W. Clark, Albany, N. Y.
 Palmers & De Mooy Foundry Co., Cleveland, O.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 I. S. Spencer's Sons, Guilford, Ct.
 Taylor & Boggis Foundry Co., Cleveland.
 Warner Bros. Co., Bridgeport, Ct.
- JAR MOLDS—See Molds, Jar and Bottle.**
- JAW CAPS, VISE—See Vise Jaw Caps.**
- JAW CLUTCHES—See Clutches, Jaw.**
- JAWS, Face Plate—**
 Hoggson & Pettis Mfg. Co., New Haven, Ct.
 Skinner Chuck Co., New Britain, Ct.
 Union Mfg. Co., New Britain, Ct.
- JAWS, Vise—**
 Prentiss Vise Co., 44 Barclay St., N. Y.
- JEWEL CASKETS, Silver Plated—**
 International Silver Co., 9-13 Maiden Lane, New York.
- JEWELERS' ROLLS, SAWS, TOOLS—See Rolls, Saws, Tools.**
- JIGS, Drill—**
 Sigourney Tool Co., Hartford, Ct.
- JOBBER, Bicycle Material and Sundries—**
 John S. Leng's Son & Co., 4 Fletcher St., New York.
- JOBBER, Hardware, Cutlery, Tools, Sporting Goods, &c.—**
 C. H. Bealy & Co., Chicago, Ill.
 Burditt & Williams, Boston, Mass.
 Chicago House Wrecking Co., Chicago, Ill.
 Dame, Stoddard & Co., Boston, Mass.
 Hartley & Graham, 313 Broadway, N. Y.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Supplee Hardware Co., Philadelphia, Pa.
- JOBBER, Watchmakers' Supplies—**
 S. F. Myers Co., 48-50 Maiden Lane, N. Y.
- JOINT COUPLINGS—See Couplings, Joint.**
- JOINTER GAUGES—See Gauges, Joiner.**
- JOINTS, Ball—**
 Boston Gear Works, Boston, Mass.
 Gould & Eberhardt, Newark, N. J.
 Robert Poole & Son Co., Baltimore, Md.
- JOINTS, Expansion—**
 Taunton Locomotive Mfg. Co., Taunton, Mass.
- JOINTS, Mica Insulating—**
 J. L. Oefinger, Chicago, Ill.
- JOINTS, Rail—**
 Chisholm & Moore Mfg. Co. Cleveland, O.
- JOINTS, Step Ladder—**
 Stanley Works, New Britain, Ct.
- JOINTS, Stump—**
 E. D. Clapp Mfg. Co., Auburn, N. Y.
- JOINTS, Universal—**
 Gould & Eberhardt, Newark, N. J.
 Stow Flexible Shaft Co., Philadelphia, Pa.
- JOIST HANGERS—See Hangers, Joist.**
- JUICE EXTRACTORS—See Extractors, Juice.**
- KAOLIN—**
 Ostrander Fire Brick Co., Troy, N. Y.
 J. W. Paxson Co., Philadelphia, Pa.
 M. D. Valentine & Bro. Co., Woodbridge, N. J.
- KEGS, Factory—**
 W. J. Clark Co., Salem, O.
- KEGS, Nail, Bolt, Nut, &c.—**
 Edwin Bell & Sons Co., Youngstown, O.
- KEROSENE BURNERS—See Burners, Kerosene.**
- KETTLE BALES—See Bales, Kettle.**
- KETTLE EARS—See Ears, Ash Pan and Kettle.**
- KETTLES, Brass—**
 Ansonia Brass & Copper Co., 19 Cliff St., New York.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Randolph-Clowes Co., Waterbury, Ct.
 Sidney Shepard & Co., Buffalo, N. Y.
 Waterbury Brass Co., Waterbury, Ct.
- KETTLES, Bronze—**
 Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.
- KETTLES, Five o'Clock Ten—**
 Goodwin & Kintz Co., Winsted, Ct.
- KETTLES, For Melting Lead—**
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Robert Poole & Son Co., Baltimore, Md.
- KETTLES, Maslin—**
 Keen & Hagerty Mfg. Co., Baltimore, Md.
- KETTLES, Smelting—**
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
- KETTLES, Soda—**
 Brown & Sharpe Mfg. Co., Providence, R. I.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Hess, Snyder & Co., Massillon, O.
- KETTLES, Steam—**
 Heat Transmission Co., Danbury, Ct.
- KETTLES, Tar—**
 Thomas Carlin's Sons, Allegheny, Pa.
 Littleford Bros., Cincinnati, O.
- KETTLES, Tea—**
 Bellaire Stamping Co., Harvey, Ill.
 Cleveland Stamping & Tool Co., Cleveland.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Rome Mfg. Co., Rome, N. Y.
 Sidney Shepard & Co., Buffalo, N. Y.
- KEY CHAINS, CHECKS, &c.—See Chains, Checks, &c.**
- KEYS AND COTTERS, SPRING—See Cotter and Keys, Spring.**
- KEYS AND KEY BLANKS—**
 Doebler Mfg. Co., Middletown, Ct.
 Norwalk Lock Co., South Norwalk, Ct.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
- KEYS, Bed—**
 Van Wagoner & Williams Hardware Co., Cleveland, O.
- KEYS, Flat Spring—**
 Cobb & Drew, Plymouth, Mass.
 Hollinger Fence Co., Greenville, O.
 Standard Tool Co., Cleveland, O.
 Wilson & Smith, Worcester, Mass.
- KEYS, Machine—**
 Norton Mfg. Co., Muskegon Heights, Mich.
- KEYS, Riveted, Machine—**
 Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
 Hollinger Fence Co., Greenville, O.
- KEYS, Shapes for—**
 Finished Steel Co., Youngstown, O.
 Kidd Bros. & Burgher Steel Wire Co., McKees Rocks, Pa.
- KEY WAY CUTTERS—See Cutters, Key Way.**
- KEY WAY MACHINES—**
 Baker Bros., Toledo, O.
 Bement, Miles & Co., Philadelphia, Pa.
 W. P. Davis Machine Co., Rochester, N. Y.
 Dubuque Machine Concern, Dubuque, Iowa.
 Hill, Clarke & Co., Boston, Mass.
 Morton Mfg. Co., Muskegon Heights, Mich.
 Niles Tool Works Co., Hamilton, O.
 J. L. Oefinger, Chicago, Ill.
 A. B. Pitkin Machinery Co., Providence, R. I.
- KICK PLATES—See Plates, Push, Pull, Kick.**
- KILLERS, Fly—**
 J. F. Bigelow, Worcester, Mass.
 Osborn Mfg. Co., Cleveland, O.
- KILNS, Dry—**
 American Blower Co., Detroit, Mich.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Buffalo Forge Co., Buffalo, N. Y.
- KILNS, Malt—**
 Littleford Bros., Cincinnati, O.
- KING BOLTS—See Bolts, King.**
- KITCHEN ARTICLES, WIRE (Egg Boilers, Vegetable Boilers, Chain Pot Cleaners, Bread Coolers, Dish Drainers, Kitchen Forks, Vegetable Lifters, Potato Mashers, Skimmers, Strainers, Toasters, Potato Fryers, Berry Washers, &c.)—**
 Cleveland Stamping & Tool Co., Cleveland.
 Edward Darby & Sons, Philadelphia, Pa.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Wickwire Bros., Cortland, N. Y.
 Wire Goods Co., Worcester, Mass.
- KITCHEN CABINETS—See Cabinets, Kitchen.**
- KITCHEN FORKS, KNIVES—See Forks, Knives.**
- KITCHEN SETS—See Sets, Kitchen Knives, &c.**
- KNIFE SHARPENERS—See Sharpeners, Knife.**
- KNIVES, Angle—**
 Sam'l Trethewey & Co., Pittsburgh, Pa.
- KNIVES, Beet—**
 Geo. H. Bishop Co., Lawrenceburg, Ind.
- KNIVES, Butcher, Bread, Shoe, &c.—**
 American Cutlery Co., Chicago, Ill.
 Cattaraugus Cutlery Co., Little Valley, N. Y.
 John Chatillon & Sons, 85 Cliff St., N. Y.
 Clark & Parsons Co., East Wilton, Me.
 Goodell Co., Antrim, N. H.
 C. J. Kimball Co., Bennington, N. H.
 New England Specialty Co., North Easton, Mass.
 L. D. Parkhurst, Danielson, Ct.
 Star Heel Plate Co., Newark, N. J.
 Tuck Mfg. Co., Brockton, Mass.
- KNIVES, Cane—**
 E. C. Atkins & Co., Indianapolis, Ind.
 Geo. H. Bishop & Co., Cincinnati, O.
 Clark & Parsons Co., East Wilton, Me.
 Henry Disston & Sons, Philadelphia, Pa.
 National Saw Co., Newark, N. J.

KNIVES, Carving—

American Cutlery Co., Chicago, Ill.

KNIVES, Cheese, Self Gauging—

Enterprise Mfg. Co., Philadelphia, Pa.

KNIVES, Cigar—

American Cutlery Co., Chicago, Ill.

KNIVES, Corn—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Clark & Parsons Co., East Wilton, Me.
Henry Disston & Sons, Philadelphia, Pa.

KNIVES, Crumb—

American Cutlery Co., Chicago, Ill.
Nelson Lyon, Albany, N. Y.

KNIVES, Drawing—

Charles Buck, Milbury, Mass.
Buck Bros., Milbury, Mass.
C. E. Jennings Co., 101 Reade St., N. Y.
C. J. Kimball Co., Bennington, N. H.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. & I. J. White Co., Buffalo, N. Y.

KNIVES, Farrier—

Heller Bros., Newark, N. J.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.
C. J. Kimball Co., Bennington, N. H.

KNIVES, Hay and Straw—

Clark & Parsons Co., East Wilton, Me.
Ney Mfg. Co., Canton, O.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.
Withington & Cooley Mfg. Co., Jackson, Mich.

KNIVES, Hedge—

Geo. H. Bishop & Co., Lawrenceburg, Ind.

KNIVES, Kitchen—

Cattaraugus Cutlery Co., Little Valley, N. Y.
John Chatillon & Sons, 85 Cliff St., N. Y.
New England Specialty Co., North Easton, Mass.
L. D. Parkhurst, Danielson, Ct.

KNIVES, Machine (Planer, Paper Cutting, Leather Splitting, Chair Bottom, Washboard, Stave, Miter, &c.)—

American Machinery Co., Grand Rapids, Mich.
Henry Disston & Sons, Philadelphia, Pa.
Fox Machine Co., Grand Rapids, Mich.
John Loyd, 558 Water St., New York.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.
Sam'l Trethewey & Co., Pittsburgh, Pa.
S. & C. Wardlow, 95 John St., New York.
L. & I. J. White Co., Buffalo, N. Y.

KNIVES, Metal Shear—See Blades, Metal Shear.**KNIVES, Mining—**

Arcade Mfg. Co., Freeport, Ill.
Geo. H. Bishop & Co., Cincinnati, O.
John H. Graham & Co., 113 Chambers St., New York.
Nelson Lyon, Albany, N. Y.
Mason & Parker, Winchenden, Mass.
Fred. J. Meyers Mfg. Co., Hamilton, O.
National Saw Co., Newark, N. J.
New England Specialty Co., North Easton, Mass.
Palmer Hardware Mfg. Co., Troy, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
N. R. Streeter & Co., Rochester, N. Y.

KNIVES, Oyster—

C. J. Kimball Co., Bennington, N. H.
L. D. Parkhurst, Danielson, Ct.
Tuck Mfg. Co., Brockton, Mass.

KNIVES, Paper, Oil Cloth, Banana, Cigar, Rubber, &c.—

American Cutlery Co., Chicago, Ill.
C. J. Kimball Co., Bennington, N. H.
L. D. Parkhurst, Danielson, Ct.
Tuck Mfg. Co., Brockton, Mass.

KNIVES, Press Button—

Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

KNIVES, Putty—

American Cutlery Co., Chicago, Ill.
Bridgeport Mfg. Co., Bridgeport, Ct.
Cattaraugus Cutlery Co., Little Valley, N. Y.
L. D. Parkhurst, Danielson, Ct.

KNIVES, Rotary Slitting—

Blake & Johnson, Waterbury, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niagara Machine & Tool Works, Buffalo, N. Y.
Samuel Trethewey & Co., Pittsburgh, Pa.

KNIVES, Saw—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Lawrenceburg, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.

KNIVES, Shoe—

Star Heel Plate Co., Newark, N. J.

KNIVES, Sportsmen's—

Billings & Spencer Co., Hartford, Ct.

KNIVES, Strike Brick—

E. C. Atkins & Co., Indianapolis, Ind.

KNIVES, Tobacco—

Tuck Mfg. Co., Brockton, Mass.

KNIVES, Wood Pulp—

Samuel Trethewey & Co., Pittsburgh, Pa.

KNOBS, Base and Floor—

Jos. Bardsley, 147-151 Baxter St., N. Y.
Union Hardware Co., Torrington, Ct.

KNOB SCREWS—See Screws, Knob.**KNOBS, Door—**

Jos. Bardsley, 147-151 Baxter St., N. Y.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
L. F. Snow, New Haven, Ct.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland.
United States Steel Lock Co., Clinton, Ia.
Weatherwax Mfg. Co., Boonton, N. J.

KNOBS, Drawer and Shutter—

Jos. Bardsley, 147-151 Baxter St., N. Y.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
Wire Goods Co., Worcester, Mass.

KNOCKERS, Door—

Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Van Wagoner & Williams Hardware Co., Cleveland, O.

KNUCKLES, Car Coupler—

Chester Steel Casting Co., Philadelphia.

KNURL HOLDERS—See Holders, Knurl.**KNURLING TOOLS—**

Billings & Spencer Co., Hartford, Ct.
Pratt & Whitney Co., Hartford, Ct.
Springfield Machine Screw Co., Springfield, Mass.

KNURLS AND KNURLED NUTS—See Nuts, Knurled.**LABELING MACHINES, Bottle—**

Chas. E. Leffler & Co., Brooklyn, N. Y.

LABELS, Brass—

George M. Ness, Jr., 61 Fulton St., N. Y.
Schwerdtle & Siebert, Bridgeport, Ct.

LABELS, Plant and Tree—

Boston & Lockport Block Co., Boston.

LABORATORY OUTFITS—

Elmer & Amend, 205 Third Ave., N. Y.

LACE LEATHER AWLS—See Awls, Lace Leather.**LACE LEATHER CUTTERS—See Cutters, Lace Leather.****LACING, LEATHER, RAWHIDE, STEEL—See Belt Lacing, Leather, Rawhide, Steel, Hooks, Belt.****LACQUERS—**

Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

LADDERS, Extension—

J. R. Clark Co., Minneapolis, Minn.
Goshen Mfg. Co., Goshen, Ind.

LADDERS, Fire—

Portland Ladder Co., Newark, N. J.

LADDERS, House Painters', &c.—

Goshen Mfg. Co., Goshen, Ind.
Portland Ladder Co., Newark, N. J.

LADDERS, Rolling Store—

Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros. Co., Poughkeepsie, N. Y.
McCabe Hanger Mfg. Co., 533-543 West 22d St., New York.
G. A. Millbradt & Co., St. Louis, Mo.
Morley Bros., Saginaw, Mich.
F. E. Myers & Bro., Ashland, O.
Portland Ladder Co., Newark, N. J.
J. D. Warren Mfg. Co., Chicago, Ill.
Wilcox Mfg. Co., Aurora, Ill.

LADDERS, Sectional and Extension—

Portland Ladder Co., Newark, N. J.

LADDERS, Steel—

E. T. Barnum, Detroit, Mich.
J. B. & J. M. Cornell, 26th St., & 11th Ave., New York.
F. E. Myers & Bro., Ashland, O.

LADDERS, Step—

Goshen Mfg. Co., Goshen, Ind.
Handy Ladder Works, Cleveland, O.
Hill Dryer Co., Worcester, Mass.
Portland Ladder Co., Newark, N. J.
R. W. Whitehurst & Co., Norfolk, Va.

LADLES, Foundry—

Byram & Co., Detroit, Mich.
Thos. Carlin's Sons, Allegheny, Pa.
Northern Engineering Works, Detroit, Mich.
S. Obermayer Co., Cincinnati, O.
Cleveland Facing Mill Co., Cleveland, O.
J. W. Paxson Co., Philadelphia, Pa.
Pennsylvania Engineering Works, New Castle, Pa.
Wm. B. Pollock Co., Youngstown, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Robert Poole & Son Co., Baltimore, Md.
Warren City Boiler Works, Warren, O.
Whiting Foundry Equipment Co., Harvey, Ill.

LADLES, Melting—

W. J. Clark Co., Salem, O.
Hollands Mfg. Co., Erie, Pa.
Logan & Strobbridge Iron Co., New Brighton, Pa.
J. W. Paxson Co., Philadelphia, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pennsylvania Engineering Works, New Castle, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
T. F. Welch Mfg. Co., Boston, Mass.

LAG AND COACH SCREWS—See Screws, Coach and Lag.**LAMP ATTACHMENTS, ELECTRIC, FOR GAS FIXTURES—See Electric Light Fittings.****LAMP BRACKETS, CHIMNEY HEATERS, &c.—See Brackets, Heaters, &c.****LAMP HOOKS—See Hooks, Chandelier or Lamp.****LAMPS, Acetylene, Bicycle, Carriage and Automobile—**

Frank E. Bundy Lamp Co., Elmira, N. Y.
Eclipse Bicycle Co., Elmira, N. Y.
Hine-Watt Mfg. Co., Chicago, Ill.

LAMPS, Acetylene Student—

Frank E. Bundy Lamp Co., Elmira, N. Y.

LAMPS, Acetylene Street Railroad—

Frank E. Bundy Lamp Co., Elmira, N. Y.

LAMPS, Arc—

General Electric Co., Schenectady, N. Y.
Hobart Electric Mfg. Co., Troy, N. Y.

LAMPS, Bicycle—

Bridgeport Brass Co., Bridgeport, Ct.
 Bridgeport Gun Implement Co., 313 Broadway, New York.
 John H. Graham & Co., 113 Chambers St., New York.
 Edward Miller & Co., Meriden, Ct.
 Plume & Atwood Mfg. Co., Waterbury, Ct.
 Scovill Mfg. Co., Waterbury, Ct.

LAMP CORD—See Wires, Electrical.**LAMPS, Furnace—**

Cleveland Facing Mill Co., Cleveland, O.
 J. W. Paxson Co., Philadelphia, Pa.
 Taylor & Boggis Foundry Co., Cleveland.

LAMPS, Gasoline Gas—

Imperial Gas Lamp Co., Chicago, Ill.
 H. Merkel, St. Louis, Mo.
 Metropolitan Daylight Lamp Co., Chicago, Ill.

LAMPS, Hand—

Bridgeport Brass Co., Bridgeport, Ct.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Tower & Lyon, 95 Chambers St., New York.

LAMPS, Incandescent—

General Electric Co., Schenectady, N. Y.
 W. R. Ostrander & Co., 22 Dey St., N. Y.

LAMPS, Iron, Malleable—

Hammer & Co., Branford, Ct.

LAMPS, Marine—

Edward Miller & Co., Meriden, Ct.

LAMPS, Miners'—

Sidney Shepard & Co., Buffalo, N. Y.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

LAMPS, Miners' Safety—

Howard & Morse, 45 Fulton St., New York.

LAMPS, Shop and Foundry—

Forest City Foundry & Mfg. Co., Cleveland.

LAMPS, Steel, Millyard, &c.—

Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

LAMPS, Street—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Edward Miller & Co., Meriden, Ct.
 Reading Foundry Co., Reading, Pa.

LAMPS, Student—

Edward Miller & Co., Meriden, Ct.

LAMPS, Table, Banquet, Hanging, Piano, &c.—

Bridgeport Brass Co., Bridgeport, Ct.
 Edward Miller & Co., Meriden, Ct.
 Plume & Atwood Mfg. Co., Waterbury, Ct.
 Scovill Mfg. Co., Waterbury, Ct.

LANTERN HOLDERS—See Holders, Lantern.**LANTERNS, Acetylene—**

Frank E. Bundy Lamp Co., Elmira, N. Y.

LANTERNS, Kerosene, &c.—

Bridgeport Brass Co., Bridgeport, Ct.
 Edward Miller & Co., Meriden, Ct.
 Tower & Lyon, 95 Chambers St., New York.

LAP LASTS—See Lasts, Lap.**LAPBOARDS—**

Maine Mfg. Co., Nashua, N. H.

LAPPING MACHINES—

Diamond Machine Co., Providence, R. I.
 Mossberg & Granville Mfg. Co., Providence, R. I.
 Niles Tool Works Co., Hamilton, O.
 Northampton Emery Wheel Co., Leeds, Mass.

LARD PRESSES—See Presses, Lard.**LARIAT AND PICKET PINS—**

Covert Mfg. Co., West Troy, N. Y.
 Imperial Bit & Snap Co., Racine, Wis.

LARIATS—

Samson Cordage Works, Boston, Mass.
 Silver Lake Co., Boston, Mass.

LASTS AND STANDS, Shoe—

Adams Co., Dubuque, Ia.
 John C. Kupferle, St. Louis, Mo.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Star Heel Plate Co., Newark, N. J.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

LASTS, LAP—

Adams Co., Dubuque, Ia.
 John C. Kupferle, St. Louis, Mo.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Star Heel Plate Co., Newark, N. J.
 Stowell Mfg. Co., South Milwaukee, Wis.

LATCHES AND LOCKS, SLIDING DOOR, BARN DOOR—See Locks and Latches.**LATCHES, Elevator Door—**

Reading Hardware Co., Reading, Pa.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

LATCHES, Gate—

John C. Kupferle, St. Louis, Mo.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 Wrightsville Hardware Co., Wrightsville, Pa.

LATCHES, LOCKS, &c.—See Locks, Latches, &c.**LATCHES, Night—**

Chantrell Tool Co., Reading, Pa.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Tower & Lyon, 95 Chambers St., N. Y.

LATCHES, Refrigerator—

Norwalk Lock Co., South Norwalk, Ct.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LATCHES, Thumb—

Arcade Mfg. Co., Freeport, Ill.
 Chicago Spring Butt Co., Chicago, Ill.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Ney Mfg. Co., Canton, O.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Stover Mfg. Co., Freeport, Ill.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
 Wilcox Mfg. Co., Aurora, Ill.
 Wrightsville Hardware Co., Wrightsville, Pa.

LATH, Corrugated Expanded Metal—

Youngstown Iron & Steel Roofing Co., Youngstown, O.

LATHE CHUCKS, DOGS, &c.—See Chucks, Dogs, &c.**LATHE GRINDERS, Center—**

Chicago Flexible Shaft Co., Chicago, Ill.

LATHES—

American Machinery Co., Grand Rapids, Mich.
 U. Balrd Machinery Co., Philadelphia, Pa.
 Barker & Chard Machine Tool Co., Cincinnati, O.
 B. F. Barnes Co., Rockford, Ill.
 W. F. & J. Barnes Co., Rockford, Ill.
 Bement, Miles & Co., Philadelphia, Pa.
 Blake & Johnson, Waterbury, Ct.
 Bullard Machine Tool Co., Bridgeport, Ct.
 Cross & Speirs Machine Co., Waterbury, Ct.
 W. P. Davis Machine Co., Rochester, N. Y.
 Detrick & Harvey Machine Co., Baltimore.
 Draper Machine Tool Co., Worcester, Mass.
 Erdle & Schenck, Rochester, N. Y.
 H. C. Fish Machine Works, Worcester, Mass.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Gleason Tool Co., Rochester, N. Y.
 Gould & Eberhardt, Newark, N. J.
 Grant Machine Tool Works, Cleveland, O.

E. Harrington, Son & Co., Philadelphia.
 Hendey Machine Co., Torrington, Ct.
 Henry F. Hill, Boston, Mass.
 Hill, Clarke & Co., Boston, Mass.
 I. H. Johnson, Jr. & Co., Philadelphia, Pa.
 Jones & Lamson Machine Co., Springfield, Vt.

Lodge & Shipley Machine Tool Co., Cincinnati, O.

J. J. McCabe, 14 Dey St., New York.
 Manning, Maxwell & Moore, 85 Liberty St., New York.

E. J. Manville Machine Co., Waterbury, Ct.
 Marshall & Huchart Machinery Co., Chicago, Ill.

Millers Falls Co., 28 Warren St., New York.
 New Haven Mfg. Co., New Haven, Ct.

Niles Tool Works Co., Hamilton, O.
 Pawling & Harnischfeger, Milwaukee, Wis.

Pennsylvania Machinery Co., Philadelphia, Pa.

Philadelphia Machine Tool Co., Philadelphia, Pa.

A. B. Pitkin Machinery Co., Providence, R. I.

Potter & Johnson Co., Pawtucket, R. I.

Pratt & Whitney Co., Hartford, Ct.

Prentiss Bros., Worcester, Mass.

Prentiss Tool & Supply Co., 115 Liberty St., New York.

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Silk, Anderson Co., Cincinnati, O.

Frank 'oomey, Philadelphia, Pa.

Wickes Bros., Saginaw, Mich.

S. M. York Co., Cleveland, O.

LATHES, Axle—

Bement, Miles & Co., Philadelphia, Pa.

Hill, Clarke & Co., Boston, Mass.

I. H. Johnson, Jr. & Co., Philadelphia, Pa.

Niles Tool Works Co., Hamilton, O.

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

LATHES, Bench—

Dwight Slate Machine Co., Hartford, Ct.

Garvin Machine Co., Spring & Varick Sts., New York.

Niles Tool Works Co., Hamilton, O.

Pratt & Whitney Co., Hartford, Ct.

LATHES, Brass—

Hill, Clarke & Co., Boston, Mass.

Niles Tool Works Co., Hamilton, O.

Pratt & Whitney Co., Hartford, Ct.

Windsor Machine Co., Windsor, Vt.

LATHES, BUFFING AND POLISHING—See Buffing and Polishing Machines.**LATHES, Car Wheel—**

E. Harrington, Son & Co., Philadelphia.

Niles Tool Works Co., Hamilton, O.

LATHES, Chucking—

American Tool Works Co., Cincinnati, O.

Cross & Speirs Machine Co., Waterbury, Ct.

Draper Machine Tool Co., Worcester, Mass.

Hill, Clarke & Co., Boston, Mass.

Lodge & Shipley Machine Tool Co., Cincinnati, O.

New Haven Mfg. Co., New Haven, Ct.

Niles Tool Works Co., Hamilton, O.

Pratt & Whitney Co., Hartford, Ct.

Windsor Machine Co., Windsor, Vt.

LATHES, Chucking Turret—

Jones & Lamson Machine Co., Springfield, Vt.

Niles Tool Works Co., Hamilton, O.

Pratt & Whitney Co., Hartford, Ct.

Windsor Machine Co., Windsor, Vt.

LATHES, Engine—

American Tool Works Co., Cincinnati, O.

Barker & Chard Machine Tool Co., Cincinnati, O.

B. F. Barnes Co., Rockford, Ill.

W. F. & John Barnes Co., Rockford, Ill.

Bullard Machine Tool Co., Bridgeport, Ct.

W. P. Davis Machine Co., Rochester, N. Y.

Detrick & Harvey Machine Co., Baltimore.

Diamond Machine Co., Providence, R. I.

Draper Machine Tool Co., Worcester, Mass.

H. C. Fish Machine Works, Worcester, Mass.

Garvin Machine Co., Spring & Varick Sts., New York.

Gleason Tool Co., Rochester, N. Y.

Gould & Eberhardt, Newark, N. J.

Hendey Machine Co., Torrington, Ct.

Henry F. Hill, Boston, Mass.

Hill, Clarke & Co., Boston, Mass.

I. H. Johnson, Jr. & Co., Philadelphia, Pa.

Lodge & Shipley Machine Tool Co., Cincinnati, O.

Manning, Maxwell & Moore, 85 Liberty St., New York.

J. J. McCabe, 14 Dey St., New York.

New Haven Mfg. Co., New Haven, Ct.

Niles Tool Works Co., Hamilton, O.

A. B. Pitkin Machinery Co., Providence, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Prentice Bros. Co., Worcester, Mass.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Seneca Mfg. Co., Seneca Falls, N. Y.
 Silk, Anderson Co., Cincinnati, O.
 Wickes Bros., Saginaw, Mich.
 W. C. Young Mfg. Co., Worcester, Mass.

LATHES, Foot—

B. F. Barnes Co., Rockford, Ill.
 W. F. & Jno. Barnes Co., Rockford, Ill.
 W. P. Davis Machine Co., Rochester, N. Y.
 Garvin Machine Co., Spring & Varick Sts., New York.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
 Wells Bros. & Co., Greenfield, Mass.
 W. C. Young Mfg. Co., Worcester, Mass.

LATHES, Gap—

American Tool Works Co., Cincinnati, O.
 I. H. Johnson, Jr., & Co., Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.
 Pratt & Whitney Co., Hartford, Ct.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

LATHES, Golf Head—

Kimball Bros. & Sprague, Brockton, Mass.

LATHES, Gun Turning and Boring—

Bement, Miles & Co., Philadelphia, Pa.
 I. H. Johnson, Jr., & Co., Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

LATHES, Hand Universal—

Brown & Sharpe Mfg. Co., Providence, R. I.

LATHES, Ingot—

Bement, Miles & Co., Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.

LATHES, LAP—See Buffing and Polishing Machines.**LATHES, Last—**

Kimball Bros. & Sprague, Brockton, Mass.

LATHES, Pit—

Gleason Tool Co., Rochester, N. Y.

LATHES, Projectile, Boring and Turning—

I. H. Johnson, Jr., & Co., Philadelphia, Pa.

LATHES, Pulley Turning—

Bement, Miles & Co., Philadelphia, Pa.
 Lodge & Shipley Machine Tool Co., Cincinnati, O.
 New Haven Mfg. Co., New Haven, Ct.
 Niles Tool Works Co., Hamilton, O.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Lloyd Booth Co., Youngstown, O.
 Diamond Drill & Machine Co., Birdsboro, Pa.
 Frank-Kneeland Machine Co., Pittsburgh.
 Mesta Machine Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 F. R. Phillips' Sons, Philadelphia, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.

LATHES, Roll Engraving—

Gould & Eberhardt, Newark, N. J.

LATHES, Roll Polishing—

Gould & Eberhardt, Newark, N. J.

LATHES, Shaft Turning—

American Tool Works Co., Cincinnati, O.
 H. C. Fish Machine Works, Worcester, Mass.
 E. Harrington, Son & Co., Philadelphia, Pa.
 Hill, Clarke & Co., Boston, Mass.
 Niles Tool Works Co., Hamilton, O.
 I. H. Johnson, Jr., & Co., Philadelphia, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

LATHES, Speed—

Automatic Machine Co., Bridgeport, Ct.
 Baush & Harris Machine Tool Co., Springfield, Mass.
 Diamond Machine Co., Providence, R. I.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Hill, Clarke & Co., Boston, Mass.
 Niles Tool Works Co., Hamilton, O.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
 Wells Bros. & Co., Greenfield, Mass.
 Windsor Machine Co., Windsor, Vt.

LATHES, Spinning—

Blake & Johnson, Waterbury, Ct.
 E. W. Bliss Co., Brooklyn, N. Y.
 Cross & Speirs Machine Co., Waterbury, Ct.
 W. H. Hibbard, Brooklyn, N. Y.
 E. J. Manville Machine Co., Waterbury, Ct.
 A. H. Merriman, Meriden, Ct.
 Niles Tool Works Co., Hamilton, O.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 Josiah Ross, Buffalo, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

LATHES, Strapping—

Springfield Mfg. Co., Bridgeport, Ct.

LATHES, Trimming—

Cross & Speirs Machine Co., Waterbury, Ct.
 E. J. Manville Machine Co., Meriden, Ct.

LATHES, Turret—

American Tool Works Co., Cincinnati, O.
 Bullard Machine Tool Co., Bridgeport, Ct.
 H. C. Fish Machine Works, Worcester, Mass.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Hill, Clarke & Co., Boston, Mass.
 I. H. Johnson, Jr., & Co., Philadelphia, Pa.
 Jones & Lamson Machine Co., Springfield, Mass.
 Lodge & Shipley Machine Tool Co., Cincinnati, O.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 New Haven Mfg. Co., New Haven, Ct.
 Niles Tool Works Co., Hamilton, O.
 Potter & Johnson Co., Pawtucket, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Windsor Machine Co., Windsor, Vt.

LATHES, Wood Turning—

American Machinery Co., Grand Rapids, Mich.
 Baker Brothers, Toledo, O.
 Egan Co., Cincinnati, O.

LATHING, Iron—

Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.

LATHING, Wire—

Clinton Wire Cloth Co., Clinton, Mass.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Merchant & Co., Philadelphia, Pa.
 Michigan Wire Cloth Co., Detroit, Mich.
 New Jersey Wire Cloth Co., Trenton, N. J.
 Scheeler's Sons, Buffalo, N. Y.
 W. S. Tyler Co., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.

LATH, Sheet Metal—

Youngstown Iron & Steel Roofing Co., Youngstown, O.

LAUNCHES—

Daimler Mfg. Co., Long Island City, N. Y.
 Palmer Bros., Mianus, Ct.
 John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.
 Truscott Boat Mfg. Co., St. Joseph, Mich.

LAUNDRY IRONS, STOVES, TUBS—See Irons, Stoves, Tubs.**LAUNDRY MACHINERY—**

V. Clad & Sons, Philadelphia, Pa.
 Paradox Machinery Co., Chicago, Ill.

LAVATORY FITTINGS AND LEGS—See Plumbing Supplies.**LAWN FOUNTAINS, MOWERS, RAKES, &c.—See Fountains, Mowers, Rakes, &c.****LAWYERS—See Attorneys.****LEAD—**

American Metal Co., 80 Wall St., N. Y.
 John Davol & Sons, 100 John St., N. Y.
 Hendricks Bros., 49 Cliff St., New York.
 Theo. Hiertz & Son, St. Louis, Mo.
 Theodore Hofeller & Co., Buffalo, N. Y.
 Lewisohn Bros., 81-83 Fulton St., N. Y.
 Markle Lead Works, St. Louis, Mo.
 Merchant & Co., Philadelphia, Pa.
 Penna. Smelting Co., Pittsburgh, Pa.
 Arthur T. Rutter, 256 Broadway, N. Y.
 J. J. Ryan & Co., Chicago, Ill.
 E. H. Stroud & Co., Chicago, Ill.

LEAD BLOCKS—See Blocks, Lead.**LEAD CAR SEALS—**

Theo. Hiertz & Son, 81-83 Fulton St., N. Y.

LEAD ENAMEL WIRE—See Wire, Electrical.**LEADERS, Cattle—**

Covert Mfg. Co., West Troy, N. Y.
 Oneida Community, Niagara Falls, N. Y.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

LEAD FURNACES—See Furnaces, Portable, &c.**LEAD PENCILS, PIPE—See Pencils, Pipe.****LEADS, Halter—**

Covert's Saddlery Works, Farmer, N. Y.

LEADS, Sounding—

W. & J. Tiebout, 118 Chambers St., N. Y.

LEATHER BELTING STRIPS—See Belting Strips.**LEATHER BELT LACING—See Belt Lacing, Leather.****LEATHER, BURNT—See Burnt Leather.****LEATHER HALF SOLES—See Half Soles.****LEATHER SPLITTING KNIVES—See Knives, Machine.****LEATHERS, Pump—**

Barnes Mfg. Co., Mansfield, O.
 Berger Bros., Philadelphia, Pa.
 Red Jacket Mfg. Co., Davenport, Ia.

LEATHER WASHERS—See Washers, Leather.**LEGAL BLANK CASES—See Cases, Legal Blank.****LEGAL ENVELOPES—See Envelopes, Legal.****LEGGING AND HEADS, Elevator—**

Littleford Bros., Cincinnati, O.

LEGS AND LAVATORY FITTINGS—See Plumbing Supplies.**LEMON SQUEEZERS—See Squeezers, Lemon.****LENS CUTTING MACHINES, DRILLS, EDGE GRINDERS—See Cutting Machines, Drills, Edge Grinders.****LETTER BINDERS—See Binders, Bill, Letter, &c.****LETTER CLIPS, BOARD—See Clips Bill, Letter, &c., Board.****LETTER FILES—See Files, Bill, &c.****LETTER OPENERS, PRESSES—See Openers, Presses.****LETTER PLATES, DROP—See Plates, Drop Letter.****LETTER SCALES—See Scales, Letter, Silver Plated.****LETTERS AND FIGURES, House, &c.—**

American Railway Supply Co., 24 Park Place, New York.
 Arcade Mfg. Co., Freeport, Ill.
 Chicago Spring Butt Co., Chicago, Ill.
 Cleveland Galvanizing Works, Cleveland, O.
 Nicol & Co., Chicago, Ill.
 Norwalk Lock Co., South Norwalk, Ct.
 Reading Hardware Co., Reading, Pa.
 Stover Mfg. Co., Freeport, Ill.
 W. & J. Tiebout, 118 Chambers St., N. Y.
 Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

LETTERS AND FIGURES, Steel—

L. A. Eucker Stamp Works, Little Ferry, N. J.
 Geo. M. Ness, Jr., 61 Fulton St., N. Y.
 Schwerdtle & Siebert, Bridgeport, Ct.

LETTERS, Cast Iron Sign—

Brown & Sharpe Mfg. Co., Providence, R. I.

LETTERS, Pattern—

Cleveland Facing Mill Co., Cleveland, O.
 S. Obermayer Co., Cincinnati, O.
 J. W. Paxson Co., Philadelphia, Pa.
 St. Louis Electrotpe Foundry, St. Louis.

LEVELERS AND GRADERS, Road—
Kilbourne & Jacobs Mfg. Co., Columbus, O.

LEVELING AND SQUARING INSTRUMENTS—See Instruments, Levelling and Squaring.

LEVELING JACKS—See Jacks, Levelling.

LEVELS AND PLUMBS—See Plumbs and Levels.

LEVEL SIGHTS—
Stanley Rule & Level Co., New Britain, Ct.

LEVELS, Bit and Square—
Stanley Rule & Level Co., New Britain, Ct.

LEVELS, Hand Bench—
C. E. Jennings Co., 101 Reade St., N. Y.

LEVELS, Iron (see also Plumbs and Levels)—
Athol Machine Co., Athol, Mass.
Henry Disston & Sons, Philadelphia, Pa.
Millers Falls Co., 28 Warren St., N. Y.
Sawyer Tool Co., Fitchburg, Mass.
Stanley Rule & Level Co., New Britain, Ct.
L. S. Starrett Co., Athol, Mass.

LEVELS, Plumbers'—
Athol Machine Co., Athol, Mass.

LEVELS, Pocket—
Athol Machine Co., Athol, Mass.
Henry Disston & Sons, Philadelphia, Pa.
Springfield Machine Screw Co., Springfield, Mass.
Stanley Rule & Level Co., New Britain, Ct.
Tower & Lyon, 95 Chambers St., N. Y.

LEVELS, Shafting—
Henry Disston & Sons, Philadelphia, Pa.

LEVER BELLS—See Bells.

LEVERS, Door Bell—
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LEVERS, Machine—
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

LIBRARY SHELVING—See Shelving, Library.

LIFTERS, Sash—
Arcade Mfg. Co., Freeport, Ill.
Hobart B. Ives & Co., New Haven, Ct.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Works, New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland.
United States Steel Lock Co., Clinton, Ia.
Van Wagoner & Williams Hardware Co., Cleveland, O.
Wrightsville Hardware Co., Wrightsville, Pa.

LIFTERS, Shutter—
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LIFTERS, Stove Lid—
Adams Co., Dubuque, Ia.
Arcade Mfg. Co., Freeport, Ill.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Albany, N. Y.
A. C. Williams, Ravenna, O.
Wire Goods Co., Worcester, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.

LIFTERS, Transom—
E. A. Ormsby, Melrose, Mass.
Pullman Sash Balance Co., Rochester, N. Y.
Reading Hardware Co., Reading, Pa.
Reading Screw Co., Norristown, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LIFTING HANDLES, SCALES—See Handles, Scales.

LIFT PUMPS—See Pumps, Lift.

LIGHTERS, Gas, Electric—
W. R. Ostrander & Co., 22 Dey St., N. Y.

LIGHTERS, Side and Deck—
Wm. Bayley Sons & Co., Milwaukee, Wis.
Edson Mfg. Co., Boston, Mass.

LIGHTNING ARRESTERS—See Arresters, Lightning.

LIGHTS, Side and Deck—
W. & J. Tiebout, 118 Chambers St., N. Y.

LIGHTS, SIDEWALK—See Iron Work, Builders'.

LIGNUMVITE, in Log—
Boston & Lockport Block Co., Boston.

LIMESTONE, Crushed—
Reed F. Blair & Co., Pittsburgh, Pa.

LINE CLEATS, GRIPS—See Cleats, Grips.

LINEX HOSE—See Hose, Linen

LINERS, Section—
L. S. Starrett Co., Athol, Mass.

LINES, Chalk, Masons', &c.—
Ossawan Mills Co., Norwich, Ct.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

LINES, Clothes, Cotton, &c.—
Ossawan Mills Co., Norwich, Ct.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

LINES, Clothes, Wire—
American Steel & Wire Co., Chicago, Ill.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Ossawan Mills Co., Norwich, Ct.
Williamsport Wire Rope Co., Williamsport, Pa.
Wire Goods Co., Worcester, Mass.
Wright & Colton Wire Cloth Co., Worcester, Mass.

LINES, Garden—
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

LININGS, Stove—
Ostrander Fire Brick Co., Troy, N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Chas. Taylor's Sons Co., Cincinnati, O.

LINK BELTING, CHAIN—See Belting, Chain Link.

LINK MACHINES, Bicycle—
Mossberg & Granville Mfg. Co., Providence, R. I.

LINKS AND PINS, Car Coupling—
Cleveland City Forge & Iron Co., Cleveland, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Keystone Drop Forge Co., Philadelphia, Pa.

LINKS, Bed—
Wm. D. Gibson Co., Chicago, Ill.
E. H. Titchener & Co., Binghamton, N. Y.

LINKS, CHAIN—See Chain Links.

LINKS, Repair—
American Steel & Wire Co., Chicago, Ill.
Bridgeport Chain Co., Bridgeport, Ct.
Keystone Drop Forge Co., Philadelphia.
Onelda Community, Niagara Falls, N. Y.
John C. Schmidt & Co., York, Pa.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.

LINOLEUM MACHINERY—
Farrel Foundry & Mach. Co., Ansonia, Ct.

LINOTYPE—
Theo. Helritz & Son, St. Louis, Mo.
I. Shonberg, 172 Hudson St., New York.

LITERATURE, Commercial—
Francis I. Maule, Philadelphia, Pa.

LOADERS, Hay—See Haying Tools.

LOCK AND COASTERS, COMBINED, BICYCLE—See Bicycle Lock and Coasters, Combined.

LOCK CORNER CUTTERS—See Cutters, Lock Corner.

LOCK CORNER MACHINERY—
Egan Co., Cincinnati, O.

LOCKERS, Gymnasium, Office, Shop, Factory, &c.—
Narragansett Machine Co., Providence, R. I.

LOCK NUTS—See Nuts, Lock.

LOCKS AND HANDLES, STORE DOOR—See Handles and Locks, Store Door.

LOCKS AND LATCHES, Barn Door—
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

LOCKS AND LATCHES, Ship—
W. & J. Tiebout, 118 Chambers St., N. Y.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LOCKS AND LATCHES, Sliding Door—
Lane Bros. Co., Poughkeepsie, N. Y.
Louden Machinery Co., Fairfield, Mass.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LOCKS AND TRIMMINGS, Car—
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LOCKS, Bicycle—
Bridgeport Gun Implement Co., 313 Broadway, New York.
John H. Graham & Co., 113 Chambers St., New York.
Smith & Egge Mfg. Co., Bridgeport, Ct.

LOCKS, Cabinet, Trunk, &c.—
Norwalk Lock Co., South Norwalk, Ct.

LOCKS, Carriage—
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

LOCKS, Car Window—
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

LOCKS, Elevator Door—
Chisholm & Moore Mfg. Co., Cleveland, O.
Reading Hardware Co., Reading, Pa.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

LOCKS, LATCHES, &c.—
Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
L. T. Snow, New Haven, Ct.
Taylor & Boggis Foundry Co., Cleveland.
United States Steel Lock Co., Clinton, Ia.
Weatherwax Mfg. Co., Boonton, N. J.

LOCKS, Pad—
Ames Sword Co., Chicopee, Mass.
Doebler Mfg. Co., Middletown, Ct.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Smith & Egge Mfg. Co., Bridgeport, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
United States Steel Lock Co., Clinton, Ia.

LOCKS, Sash—
Brohard & Co., Philadelphia, Pa.
Caldwell Mfg. Co., Rochester, N. Y.
W. & E. T. Fitch Co., New Haven, Ct.
Hobart B. Ives & Co., New Haven, Ct.
J. L. Oefinger, Chicago, Ill.
Reading Hardware Co., Reading, Pa.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland.

LOCKS, Trunk and Bag—
R. C. Jenkinson & Co., Newark, N. J.

LOCOMOTIVE BLOCKS, REFLECTORS, TRANSFER TABLES—See Blocks, Reflectors, Transfer Tables.

LOCOMOTIVE JACKET STEEL SHEETS—
American Sheet Steel Co., Battery Park Building, New York.

LOCOMOTIVE LINERS—
L. S. Starrett Co., Athol, Mass.

LOCOMOTIVES, Steam and Electric—
Thomas P. Conard, Philadelphia, Pa.
J. W. Hoffmann & Co., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., Columbus, O.

LOCOMOTIVE WORKS MACHINERY—
Bement, Miles & Co., Philadelphia, Pa.
Hilles & Jones Co., Wilmington, Del.
Niles Tool Works Co., Hamilton, O.
Poulterier & Co., Philadelphia, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Wickes Bros., Saginaw, Mich.

LODGE BELLS—See **Bells, Altar and Lodge.**

LOG AND LUMBER TOOLS—

Peter Gerlach & Co., Cleveland, O.
Wickes Bros., Saginaw, Mich.

LOG BINDERS, CHAINS—See **Binders, Chains.**

LOG HAULS—

Buhl Malleable Co., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
Link-Belt Engineering Co., Philadelphia.
Wickes Bros., Saginaw, Mich.

LOG JACKS—See **Jacks, Log.**

LOOM BOLTS—See **Bolts, Loom.**

LOOMS, Duck—

Robert Poole & Son Co., Baltimore, Md.

LOOMS, Power—

Fairmount Machine Co., Philadelphia, Pa.

LOOPS, FURNITURE—See **Staples and Loops, Furniture.**

LOOPS, Mast—

W. & J. Tiebout, 118 Chambers St., N. Y.

LUBRICANTS—

Jos. Dixon Crucible Co., Jersey City, N. J.
See also *Grease, Axle.*

LUBRICANTS, Gear—

Ironsides Co., Columbus, O.

LUBRICATORS—

Crosby Steam Gage & Valve Co., Boston.
Dodge Mfg. Co., Mishawaka, Ind.
Lunkenheimer Company, Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John St., New York.

LUGS, Bicycle—See **Bicycle Lugs.**

LUMBER TOOLS, &c.—See **Tools, &c.**

MACHETES—

Clark & Parsons Co., East Wilton, Me.

MACHINE BOLTS—See **Bolts, Machine.**

MACHINE HANDLES, KNIVES, LEVERS, SCREWS—See **Handles, Knives, Levers, Screws.**

MACHINERY, classified under the headings descriptive of character thereof.

MACHINERY DEALERS—

American Tool Works Co., Cincinnati, O.
U. Baird Machinery Co., Pittsburgh, Pa.
Chicago House Wrecking Co., Chicago, Ill.
Marvin Briggs, 12 Broadway, New York.
Chandler & Farquhar, Boston, Mass.
J. E. Costello Machine Works, Brooklyn.
W. P. Davis Machine Co., Rochester, N. Y.
Fairbanks Co., 311 Broadway, New York.
General Supply Co., 40 John St., N. Y.
Hill, Clarke & Co., Boston, Mass.
Henry F. Hill, Boston, Mass.
J. H. Hillman & Son, Pittsburgh, Pa.
S. T. Lund, Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Huschart Machinery Co., Chicago, Ill.
J. J. McCabe, 14 Dey St., New York.
McDowell & Stocker Co., Chicago, Ill.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Works Co., Hamilton, O.
A. B. Pitkin Machinery Co., Providence, R. I.
Poulterer & Co., Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
L. F. Seyfert's Sons, Philadelphia, Pa.
Thomas & Lowe Machinery Co., Providence, R. I.
Frank Toomey, Philadelphia, Pa.
W. W. Whitehead, Davenport, Iowa.
Wickes Bros., Saginaw, Mich.

MACHINERY, Electric Mining—

General Electric Co., Schenectady, N. Y.

MACHINERY FOR HANDLING MATERIALS—

Brown Hoisting & Conveying Machine Co., Cleveland, O.
Buhl Malleable Co., Detroit, Mich.
Heyl & Patterson, Pittsburgh, Pa.
C. W. Hunt Co., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
Link-Belt Engineering Co., Philadelphia.
Trenton Iron Co., Trenton, N. J.
Wellman-Seaver Engineering Co., Cleveland, O.

MACHINERY, Mining—

Allentown Rolling Mills, Allentown, Pa.
E. P. Allis Co., Milwaukee, Wis.
Ingersoll-Sergeant Drill Co., 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.
Rand Drill Co., 100 Broadway, New York.
Weber Gas & Gasoline Engine Co., Kansas City, Mo.

MACHINERY, Potato—

Aspinwall Mfg. Co., Jackson, Mich.

MACHINERY, SECOND HAND—See **Second Hand Machinery.**

MACHINES, SEWING—See **Sewing Machines.**

MACHINISTS' CLAMPS, RULES, SCRAPERS, SQUARES—See **Clamps, Rules, Scrapers, Squares.**

MAGAZINES, Iron—

Garry Iron & Steel Roofing Co., Cleveland, O.

MAGAZINES, POWDER—

Littleford Bros., Cincinnati, O.

MAGNET HAMMERS—See **Hammers.**

MAGNETS, Lifting—

Electric Controller and Supply Co., Cleveland, O.

MAGNET WIRE—See **Wires, Electrical.**

MAIL BOXES, CATCHERS—See **Boxes, Catchers.**

MALLEABLE CLEAVISES, HOOKS AND EYES, RINGS—See **Cleavises, Hooks and Eyes, Rings.**

MALLEABLE IRON CASTINGS, HINGES—See **Castings, Hinges.**

MALLEABLE T WRENCHES—See **Wrenches, Malleable T.**

MALLETS, CALKING—

W. & J. Tiebout, 118 Chambers St., N. Y.

MALLETS, Rubber—

Boston Belting Co., Boston, Mass.
J. W. Paxson Co., Philadelphia, Pa.

MALLETS, Wooden—

R. Bliss Mfg. Co., Pawtucket, R. I.
Boston & Lockport Block Co., Boston.
W. R. Hartigan, Collinsville, Ct.
J. W. Paxson Co., Philadelphia, Pa.
John Sommer's Son, Newark, N. J.
Stanley Rule & Level Co., New Britain, Ct.
Union Hardware Co., Torrington, Ct.

MANDRELS—

Adams Co., Dubuque, Ia.
E. C. Atkins & Co., Indianapolis, Ind.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Cleveland Twist Drill Co., Cleveland, O.
Henry Disston & Sons, Philadelphia, Pa.
W. G. Le Count, South Norwalk, Ct.
Morse Twist Drill & Machine Co., New Bedford, Mass.
National Saw Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Plunger & Henger Mfg. Co., St. Louis, Mo.
Pratt & Whitney Co., Hartford, Ct.
John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.
Standard Tool Co., Cleveland, O.
Wiley & Russell Mfg. Co., Greenfield, Mass.

MANDRELS, Saw—See **Arbors, Circular Saw.**

MANE COMBS—See **Combs, Mane and Tail.**

MANGANESE BRONZE, CASTINGS, FORGINGS—See **Bronze, Castings, Forgings.**

MANGERS, FEED—

Variety Machine Co., Warsaw, N. Y.
R. W. Whitehurst & Co., Norfolk, Va.

MANGLES—

V. Clad & Sons, Philadelphia, Pa.
Paradox Machinery Co., Chicago, Ill.

MAN HEADS—

Lukens Iron & Steel Co., Coatesville, Pa.

MAN HOLE BORING MACHINES—See **Boring Machines, Man Hole.**

MAN HOLE CASTINGS—See **Castings, Man Hole, Cistern, Sewer, &c.**

MANICURE GOODS—

Nicholson File Co., Providence, R. I.

MANICURE SETS—See **Sets, Silver Plated.**

MANTEL GRATES—See **Grates.**

MANUAL TRAINING SCHOOL OUTFITS—See **School Outfits, Manual Training.**

MANUFACTURING PROPERTIES—

J. H. Hillman & Son, Pittsburgh, Pa.
Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.
Southern Railway Co., Washington, D. C.

MANURE FORKS, HOOKS, PUMPS—See **Forks, Hooks, Pumps.**

MARBLE WORKING MACHINERY—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
F. R. Patch Mfg. Co., Rutland, Vt.

MARINE CLOCKS—See **Clocks, Marine.**

MARKERS, Clapboard—

Stanley Rule & Level Co., New Britain, Ct.

MARKERS, ICE—See **Ice Harvesting Tools.**

MARKERS, Poultry and Leg Bands—R. Woodman Mfg. & Supply Co., Boston.

MARKERS, Tire—

Wiley & Russell Mfg. Co., Greenfield, Mass.

MARKET WIRE—See **Wire, Iron and Steel, &c.**

MARKING GAUGES—See **Gauges.**

MARKING MACHINES—

Dwight Slate Machine Co., Hartford, Ct.
Pratt & Whitney Co., Hartford, Ct.
Wm. E. Pratt Mfg. Co., Chicago, Ill.

MARLIN SPIKES—See **Spikes, Marlin, Pickers, &c.**

MASHERS, Vegetable, &c.—

F. E. Kohler & Co., Canton, O.
John Sommer's Son, Newark, N. J.
N. R. Streeter & Co., Rochester, N. Y.

MASONS' CHALK, &c., LINES—See **Lines, Chalk, &c.**

MASONS' HORSES—See **Horses, Masons'.**

MAST GREASE—See **Grease, Mast.**

MATCH BOXES, SAFES—See **Boxes, Safes.**

MATCH BOX HOLDERS—See **Holders, Match Box.**

MATERIAL, Old—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
M. J. & J. Blake, New York.
Bole, Ross & Co., Pittsburgh, Pa.
C. Botyer, Hoboken, N. J.
Thomas B. Conrad, Philadelphia, Pa.
Justice Cox, Jr., Philadelphia, Pa.
Robert M. Cunliffe, Philadelphia, Pa.
Donaldson & Newton, Philadelphia, Pa.
Eastern Forge Co., Boston, Mass.
Ed. J. Etting, Philadelphia, Pa.
F. Greimer, Philadelphia, Pa.
J. H. Hillman & Son, Pittsburgh, Pa.
H. A. Hitner's Son, Philadelphia, Pa.
Isaac Joseph Iron Co., Cincinnati, O.
Jerome Keeley & Co., Philadelphia, Pa.
Henry Lewis & Co., Philadelphia, Pa.
Chas. E. McInnes & Co., Philadelphia, Pa.
J. J. Mohr, Philadelphia, Pa.
New Jersey Iron & Metal Co., Trenton, N. J.
Nicolls, Wheeler & Co., Philadelphia, Pa.
Wm. H. Perry & Co., Providence, R. I.
F. R. Phillips' Sons, Philadelphia, Pa.
Phillips & Crane, Philadelphia, Pa.
W. H. Rogers, Bridgeport, Ct.
Frank Samuel, Philadelphia, Pa.
M. Samuel & Sons, Brooklyn, N. Y.
Morton B. Smith, 243 Front St., New York.
E. H. Stroud & Co., Chicago, Ill.
Walsh Bros. & Co., Newark, N. J.
W. W. Whitehead, Davenport, Iowa.
E. H. Wilson & Co., Philadelphia, Pa.
L. & R. Wister & Co., Philadelphia, Pa.

MAT PUNCHES—See **Punches, Mat.**

MATS AND MATTINGS, Rubber—

Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

MATS, TABLE, WIRE—See Household Articles, Wire.**MATS, Wire and Steel—**

E. T. Barnum, Detroit, Mich.
Hartman Mfg. Co., Ellwood City, Pa.
Scheeler's Sons, Buffalo, N. Y.
United States Wire Mat Co., Decatur, Ill.
Wire Goods Co., Worcester, Mass.

MATTOCKS—See Picks.**MAULS—**

John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Van Wagoner & Williams Hardware Co.,
Cleveland, O.
A. C. Williams, Ravenna, O.

MEASURES, Iron Dry—

W. J. Clark Co., Salem, O.

MEASURES, Linear—

Stanley Rule & Level Co., New Britain, Ct.

MEASURES, Liquid—

John Chatillon & Sons, 85 Cliff St., N. Y.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

MEASURES, Tape—

Lufkin Rule Co., Saginaw, Mich.
Waterbury Brass Co., Waterbury, Ct.

MEASURING FAUCETS, WHEELS—See Faucets, Wheels.**MEASURING RODS, Standard, End—**

Brown & Sharpe Mfg. Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.
John M. Rogers Boat, Gauge & Drill Works,
Gloucester City, N. J.

MEAT AND VEGETABLE CUTTERS—See Cutters, Vegetable.**MEAT CHOPPERS AND CUTTERS—See Cutters, Meat and Vegetable.****MEAT DISHES—See Dishes, Silver Plated.****MEAT HOOKS, PRESSES—See Hooks, Presses.****MECHANICAL RUBBER GOODS, STOKERS—See Rubber Goods, Stokers'.****MEDICINE CABINETS—See Cabinets, Medicine, Shaving, &c.****MENDERS, HARNESS—**

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Root Bros. Co., Plymouth, O.

MENDERS, HOSE—See Hose Attachments.**MENDING PLATES—See Plates, Mending.****MERCANTILE CABINET FILES—See Cabinets, File, Mercantile.****MERCHANTS, IRON AND STEEL—See Iron and Steel Brokers and Merchants.****MERCHANTS, Metal—**

American Metal Co., 80 Wall St., N. Y.
John Davol & Sons, 100 John St., N. Y.
Hendricks Brothers, 49 Cliff St., N. Y.
U. T. Hungerford Brass & Copper Co., 121
Worth St., New York.
Hyde Bros. & Co., Pittsburgh, Pa.
Lewisohn Brothers, 81 & 83 Fulton St.,
New York.
Charles Millar & Son, Utica, N. Y.
Arthur T. Rutter, 256 Broadway, N. Y.
Morton B. Smith, 243 Front St., New York.
E. H. Stroud & Co., Chicago, Ill.

METAL, ANTI-FRICTION, BRONZE, &c.—See Anti-Friction, Bronze, &c.**METAL GOODS, SHEET, TO ORDER—See Sheet Metal Goods, to Order.****METAL LACQUERS—See Lacquers, Metal.****METALLIC BASKETS—See Baskets, Metallic.****METALLIC EYELETS, SHINGLES—See Eyelets, Shingles.****METAL, Perforated—**

Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
Erdle & Schenck, Rochester, N. Y.

METAL, Platers', or Gold—

Bridgeport Brass Co., Bridgeport, Ct.
Scovill Mfg. Co., Waterbury, Ct.

METAL POLISH, SCRIBERS—See Polish, Scrubbers.**METAL SPECIALTIES TO ORDER—**

W. J. Clark Co., Salem, O.
Dodge Machine Screw Co., Boston, Mass.
Houghton & Buxton Mfg. Co., Worcester,
Mass.
Frank Mossberg Co., Attleboro, Mass.

METAL WORK, Milled, Turned or Stamped, to Order—

W. J. Clark Co., Salem, O.
Clark & Cowles, Plainville, Ct.
Crescent Brass & Iron Co., Grand Rapids,
Mich.
Dodge Machine Screw Co., Boston, Mass.
G. Drouve Co., Bridgeport, Ct.
Hartford Machine Screw Co., Hartford, Ct.
A. & T. McKenna, Pittsburg, Pa.
Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

METAL WORK, Perforated—

Littleford Bros., Cincinnati, O.

METERS, Ampere Recording—

Bristol Co., Waterbury, Ct.

METERS, Blast—

Byram & Co., Detroit, Mich.

METERS, Eave Trough—

Kanneberg Roofing Co., Canton, O.

METERS, Recording Volt—

Bristol Co., Waterbury, Ct.
General Electric Co., Schenectady, N. Y.
Zucker & Levett & Loeb Co., 526-530 West
25th St., New York.

METERS, Recording Watt—

Bristol Co., Waterbury, Ct.
General Electric Co., Schenectady, N. Y.

MICA—

Merchant & Co., Philadelphia, Pa.

MICA INSULATING JOINTS—See Joints, Mica, Insulating.**MICROMETER CALIPERS, HOLDERS—See Calipers, Holders.****MICROMETERS—**

Athol Machine Co., Athol, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.
J. T. Slocumb & Co., Providence, R. I.
L. S. Starrett Co., Athol, Mass.

MICROMETERS, Paper—

Brown & Sharpe Mfg. Co., Providence, R. I.

MILK CANS, STRAINERS, TESTERS—See Strainers, Testers.**MILK CAN STOCK—**

Sidney Shepard & Co., Buffalo, N. Y.

MILKMAN'S BELLS—See Bells, Milkman's.**MILLED, TURNED OR STAMPED METAL WORK, TO ORDER—See Metal Work, Milled, Turned or Stamped, to Order.****MILLING AND DRILLING MACHINES, Butt—**

F. B. Shuster Co., New Haven, Ct.

MILLING ATTACHMENTS—

Adams Co., Dubuque, Ia.
Becker-Brainard Milling Machine Co.,
Hyde Park, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Milling Machine Co., Cincinnati,
O.
Garvin Machine Co., Spring & Varick Sts.,
New York.
Pratt & Whitney Co., Hartford, Ct.

MILLING MACHINES—

Adams Co., Dubuque, Iowa.
American Tool Works Co., Cincinnati, O.
Aurora Tool Works, Aurora, Ind.
Bement, Miles & Co., Philadelphia, Pa.
Blake & Johnson, Waterbury, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Brown & Sharpe Mfg. Co., Providence, R. I.
Carter & Hakes Machine Co., Winsted, Ct.
Cincinnati Milling Machine Co., Cincinnati,
O.

Asa S. Cook Co., Hartford, Ct.
J. E. Costello Machine Works, Brooklyn.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring & Varick Sts.,
New York.

Geo. Gorton Machine Co., Racine, Wis.
E. Harrington, Son & Co., Philadelphia.
W. H. Hibbard, Brooklyn, N. Y.
Hill, Clarke & Co., Boston, Mass.
Hilles & Jones Co., Wilmington, Del.
Ingersoll Milling Machine Co., Rockford,
Ill.

Lucas & Gilem, Philadelphia, Pa.
J. J. McCabe, 14 Dey St., New York.
Marshall & Hushart Machinery Co., Chicago,
Ill.

Mossberg & Granville Mfg. Co., Providence,
R. I.

Niles Tool Works Co., Hamilton, O.
Norton Mfg. Co., Muskegon Heights, Mich.
Pennsylvania Machinery Co., Philadelphia,
Pa.

A. B. Pitkin Machinery Co., Providence,
R. I.

Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty
St., New York.

A. D. Quint, Hartford, Ct.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
F. B. Shuster Co., New Haven, Ct.

Frank Toomey, Philadelphia, Pa.
Waterbury Farrel Foundry & Machine Co.,
Waterbury, Ct.

S. M. York Co., Cleveland, O.

MILLING MACHINES, Bench and Hand—

J. E. Costello Machine Works, Brooklyn.
Pratt & Whitney Co., Hartford, Ct.

MILLING MACHINES, Double End—

Lucas & Gilem, Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
F. B. Shuster Co., New Haven, Ct.

MILLING MACHINES, Nut and Bolt Head—

Dwight Slate Machine Co., Hartford, Ct.
Niles Tool Works Co., Hamilton, O.

MILLING MACHINES, Tools for—

Brown & Sharpe Mfg. Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.

MILLING MACHINES, Turret—

A. D. Quint, Hartford, Ct.

MILLING MACHINES, Universal—

Becker-Brainard Milling Machine Co.,
Hyde Park, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

MILLING MACHINES, Vertical—

American Tool Works Co., Cincinnati, O.
Blake & Johnson, Waterbury, Ct.
Becker-Brainard Milling Machine Co.,
Hyde Park, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Fox Machine Co., Grand Rapids, Mich.
Lucas & Gilem, Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

MILLS, Adjustable Hollow—

Geometric Drill Co., Westville, Ct.
Morse Twist Drill & Machine Co., New
Bedford, Mass.
John M. Rogers Boat, Gauge & Drill Works,
Gloucester City, N. J.

MILL SAWS—See Saws, Mill, Mulay, Crosscut, Drag, &c.**MILLS, Bone—**

W. J. Adams, Joliet, Ill.
Enterprise Mfg. Co., Philadelphia, Pa.
Logan & Strobbridge Iron Co., New Brighton,
Pa.

MILLS, Boring and Turning—

American Tool Works Co., Cincinnati, O.
Baush & Harris Machine Tool Co., Springfield,
Mass.
Bement, Miles & Co., Philadelphia, Pa.
Bickford Drill & Tool Co., Cincinnati, O.
Bullard Mch. Tool Co., Bridgeport, Ct.
Draper Machine Tool Co., Worcester, Mass.
Hill, Clarke & Co., Boston, Mass.
Lucas & Gilem, Philadelphia, Pa.
Manning, Maxwell & Moore, 85 Liberty St.,
New York.
New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works Co., Hamilton, O.
Pawling & Harnishfeger, Milwaukee, Wis.
Pratt & Whitney Co., Hartford, Ct.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Wals & Roos Punch & Shear Co., Cincinnati,
O.

MILLS, Car Wheel Boring—

Bickford Drill & Tool Co., Cincinnati, O.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

MILLS, Cider—

Logan & Strobbridge Iron Co., New Brighton, Pa.
R. W. Whitehurst & Co., Norfolk, Va.

MILLS, Cider—

Byram & Co., Detroit, Mich.

MILLS, Coffee, Spice, &c.—

Arcade Mfg. Co., Freeport, Ill.
Enterprise Mfg. Co., Philadelphia, Pa.
Lane Bros. Co., Poughkeepsie, N. Y.
Logan & Strobbridge Iron Co., New Brighton, Pa.
National Specialty Mfg. Co., Philadelphia.
Charles Parker Co., Meriden, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

MILLS, Continuous Hoop and Cotton Tie—

Morgan Construction Co., Worcester, Mass.

MILLS, Corn and Feed—

W. J. Adams, Joliet, Ill.
Edw. P. Allis Co., Milwaukee, Wis.
Enterprise Mfg. Co., Philadelphia, Pa.
Havana Metal Wheel Co., Havana, Ill.
Janesville Hay Tool Co., Janesville, Wis.
Lane Bros. Co., Poughkeepsie, N. Y.
Logan & Strobbridge Iron Co., New Brighton, Pa.
J. H. McLain Co., Canton, O.
Sandwich Enterprise Co., Sandwich, Ill.
Stover Mfg. Co., Freeport, Ill.
J. K. Wilder & Son, Monroe, Mich.

MILLS, Drug—

Enterprise Mfg. Co., Philadelphia, Pa.
Lane Bros. Co., Poughkeepsie, N. Y.
Logan & Strobbridge Iron Co., New Brighton, Pa.
National Specialty Mfg. Co., Philadelphia.
Charles Parker Co., Meriden, Ct.

MILLS, End—

Brown & Sharpe Mfg. Co., Providence, R. I.
Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.
T. F. Welch Mfg. Co., Boston, Mass.

MILLS, FACE, with Inserted Teeth—

Brown & Sharpe Mfg. Co., Providence, R. I.

MILLS, Family Grist—

Stover Mfg. Co., Freeport, Ill.

MILLS, For Rolling Tin Foil—

Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

MILLS, Lath and Stave—

Filler & Stowell Co., Milwaukee, Wis.
Wickes Bros., Saginaw, Mich.

MILLS, Rod Tapering—

Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

MILL SUPPLIES—

R. Bliss Mfg. Co., Pawtucket, R. I.
New England Specialty Co., North Easton, Mass.
W. S. Tyler Co., Cleveland, O.

MILLS, Wind—

Flint & Walling Mfg. Co., Kendallville, Ind.
Sandwich Enterprise Co., Sandwich, Ill.
Stover Mfg. Co., Freeport, Ill.

MILLS, Wire Flattening—

Blake & Johnson, Waterbury, Ct.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

MILL WIRE GOODS—See Wire Goods, Mill.**MILL YARD STEEL LAMPS—See Lamps, Steel Mill Yard, &c.****MINCING KNIVES—See Knives, Mining.****MINE SUPPLIES—**

Jeffrey Mfg. Co., Columbus, O.

MINERS' LAMPS—See Lamps, Miners'.**MINING APPLIANCES—**

Edw. P. Allis Co., Milwaukee, Wis.
W. J. Clark Co., Salem, O.
Ingersoll-Sergeant Drill Co., 26 Cortlandt St., New York.

MINING MACHINERY—

E. P. Allis Co., Milwaukee, Wis.
Farrel Foundry & Mach. Co., Ansonia, Ct.
Ingersoll-Sergeant Drill Co., 26 Cortlandt St., New York.
F. W. Iredell, 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.

MIRROR FRAMES—See Frames, Mirror, Photograph, Brass.**MIRRORS, Brass Framed—**

Crescent Brass & Iron Co., Detroit, Mich.

MITER BOXES, RODS—See Boxes, Rods.**MITER PLANERS—**

American Machinery Co., Grand Rapids, Mich.
Millers Falls Co., 28 Warren St., N. Y.

MITERS, Eave Trough—

Berger Bros. Co., Philadelphia, Pa.
Garry Iron & Steel Roofing Co., Cleveland, O.

MITER SQUARES—See Squares, Try.**MIXERS, Concrete—**

Thos. Carlin's Sons, Allegheny, Pa.
Jeffrey Mfg. Co., Columbus, O.

MIXING MACHINES, Sand—

Gould & Eberhardt, Newark, N. J.
Jeffrey Mfg. Co., Columbus, O.
J. W. Paxson Co., Philadelphia, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

MODEL AND EXPERIMENTAL WORK—

G. Birnbaum, Cleveland, O.
Cleveland Galvanizing Works, Cleveland, O.
D'Amour & Littledale Machine Co., 129 Worth St., New York.
Goodwin & Kintz Co., Winsted, Ct.
E. Konigsow & Bro., Cleveland, O.
Pratt & Whitney Co., Hartford, Ct.
J. J. Ryan & Co., Chicago, Ill.

MODELS, Locomotive Link Motion—

Pedrick & Ayer Co., Philadelphia, Pa.

MOLASSES GATES—See Gates, Oil and Molasses.**MOLDERS' BELLOWES—See Bellows, Blacksmiths', &c.****MOLDERS' TOOLS—**

Cleveland Facing Mill Co., Cleveland, O.
S. Obermayer Co., Cincinnati, O.

MOLDING MACHINES—

W. F. & John Barnes Co., Rockford, Ill.
Adams Co., Dubuque, Wis.
Edward J. Etting, Philadelphia, Pa.
Gleason Tool Co., Rochester, N. Y.
Maywood Foundry & Machine Co., Chicago, Ill.
S. Obermayer Co., Cincinnati, O.
Henry E. Pridmore, Chicago, Ill.
J. W. Paxson Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Tabor Mfg. Co., Elizabeth, N. J.
Whiting Foundry & Equipment Co., Harvey, Ill.
T. B. Woods' Sons, Waterbury, Ct.

MOLDING MACHINES, Car Wheel—

Maywood Foundry & Machine Co., Chicago, Ill.
Henry E. Pridmore, Chicago, Ill.

MOLDING MACHINES, Pulley—

Hill, Clarke & Co., Boston, Mass.
Maywood Foundry & Machine Co., Chicago, Ill.
Henry E. Pridmore, Chicago, Ill.

MOLDING MACHINES, Stone—

F. R. Patch Mfg. Co., Rutland, Vt.

MOLDINGS, Brass—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Randolph-Clowes Co., Waterbury, Ct.

MOLDS, For Casting Metals—

W. H. Hibbard, Brooklyn, N. Y.
Schwerdtle & Siebert, Bridgeport, Ill.

MOLDS, Ingot—

Reed F. Blair & Co., Pittsburgh, Pa.
Lorain Foundry Co., Lorain, O.
Mesta Machine Co., Pittsburgh, Pa.
Mossberg & Granville Mfg. Co., Providence, R. I.
J. W. Paxson Co., Philadelphia, Pa.
Philadelphia Roll Machine Co., Philadelphia, Pa.

MOLE TRAPS—See Traps, Mole.**MOLYBDENUM-NICKEL—**

Geo. G. Blackwell Sons & Co., Liverpool, England.

MONEY DRAWERS—See Tills, Alarm.**MOPS, STICKS, &c.—**

Arcade Mfg. Co., Freeport, Ill.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Reading Hardware Co., Reading, Pa.
Stover Mfg. Co., Freeport, Ill.

MORTAR BOARDS, BEDS—See Boards, Beds, Mortar.**MORTAR HOES, HOISTS—See Hoes, Hoists.****MORTISERS, Hollow Chisel—**

J. A. Fay & Co., Cincinnati, O.

MORTISING MACHINES—

W. F. & John Barnes Co., Rockford, Ill.
J. A. Fay & Co., Cincinnati, O.
Gould & Eberhardt, Newark, N. J.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

MOSQUITO NETTINGS—See Nettings, Mosquito.**MOTORS, Compressed Air—**

Chisholm & Moore Mfg. Co., Cleveland, O.
Helwig Mfg. Co., St. Paul, Minn.
Northern Engineering Works, Detroit, Mich.
Pneumatic Crane Co., Pittsburgh, Pa.

MOTORS, Electric—

Thos. H. Dallett & Co., Philadelphia, Pa.
Eddy Electric Co., Windsor, Ct.
General Electric Co., Schenectady, N. Y.
Hobart Electric Mfg. Co., Troy, O.
Jeffrey Mfg. Co., Columbus, O.
Lorain Steel Co., Lorain, O.
Maxwell M. Mayer Electric Co., 2d Ave. & 121st St., New York.
Stow Mfg. Co., Binghamton, N. Y.
B. F. Sturtevant Co., Boston, Mass.
Frank Toomey, Philadelphia, Pa.

MOTORS, Electric Fan—

General Electric Co., Schenectady, N. Y.
W. R. Ostrander & Co., 22 Dey St., N. Y.
B. F. Sturtevant Co., Boston, Mass.

MOTOR SPRINGS—See Springs, Motor.**MOTORS, Wagon and Carriage—**

Palmer Bros., Mianus, Ct.

MOTORS, Water—

Humphries Mfg. Co., Mansfield,

MOUNTINGS, Carriage and Coach—

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

MOUSE TRAPS—See Traps, Rat and Mouse.**MOWERS, Lawn—**

Coldwell Lawn Mower Co., Newburgh, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Lawson Mfg. Co., Milwaukee, Wis.
Ney Mfg. Co., Canton, O.
Philadelphia Lawn Mower Co., Philadelphia, Pa.
Supplee Hardware Co., Philadelphia, Pa.

MUCK BARS—See Bars, Muck.**MUFFLERS, Annealing—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

MULAY SAWS—See Saws, Crosscut, Drag, Mill, &c.**MULE AND HORSE SHOES—See Shoes, Horse and Mule.****MUSICAL MERCHANDISE—**

S. F. Myers Co. 48-50 Malden Lane, N. Y.

MUSIC DESK SPRINGS—See Braces, Music Rack.**MUZZLES—**

Edward Darby & Sons, Philadelphia, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Wire Goods Co., Worcester, Mass.
Wright & Colton Wire Cloth Co., Worcester, Mass.

NAIL CLAWS, CLIPPERS, PULLERS, &c.—See Claws, Clippers, Pullers, &c.

NAIL MACHINES, Cut—

Kimball Bros. & Sprague, Brockton, Mass.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Wm. A. Sweetser, Brockton, Mass.
Totten & Hogg Iron & Steel Foundry Co.,
Pittsburgh, Pa.

NAIL MACHINES, Shoe—

Jesse Atherton, Auburn, R. I.
Kimball Bros. & Sprague, Pittsburgh, Pa.
Wm. A. Sweetser, Brockton, Mass.

NAIL MACHINES, Wire—

Jesse Atherton, Auburn, R. I.
Bates Machine Co., Joliet, Ill.
Blake & Johnson, Waterbury, Ct.
Braddock Machine & Mfg. Co., Braddock,
Pa.
W. H. Hibbard, Brooklyn, N. Y.
Kimball Bros. & Sprague, Pittsburgh, Pa.
H. J. Miller, Bridgewater, Mass.
National Machinery Co., Tiffin, O.
Henry Perkins, Bridgewater, Mass.
Wm. A. Sweetser, Brockton, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga
Falls, O.

**NAIL KEGS—See Kegs, Nail, Bolt, Nut,
&c.****NAIL FULLER AND BAND CUTTER—**

L. T. Snow, New Haven, Ct.

NAILS AND TACKS, Brush—

Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Ripley & Bartlett, Plymouth, Mass.
Shelton & Co., Derby, Ct.

NAILS AND TACKS, Copper—

Diamond Tack & Nail Works, Raynham,
Mass.
U. T. Hungerford Brass & Copper Co., 121
Worth St., New York.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Merchant & Co., Philadelphia, Pa.
Milwaukee Tack Co., Milwaukee, Wis.
Plymouth Mills, Plymouth, Mass.

NAILS AND TACKS, Trunk—

Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.

NAILS, Clout—

Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Ripley & Bartlett, Plymouth, Mass.
Shelton Co., Derby, Ct.

**NAILS, COPPER SHOE—See Tacks and
Nails.****NAILS, Corrugated—**

Ripley & Bartlett, Plymouth, Mass.

NAILS, Countersink Head—

Ripley & Bartlett, Plymouth, Mass.

NAILS, Cut—

Grand Crossing Tack Co., Grand Crossing,
Ill.
H. J. Miller, Bridgewater, Mass.
Pierson & Co., 29 Broadway, New York.
Republic Iron & Steel Co., Chicago, Ill.
Shelton Co., Derby, Ct.
Tower Mfg. Co., Madison, Ind.
Wm. H. Wallace & Co., 66 Broadway, N. Y.

NAILS, Fender—

H. O. Canfield, Bridgeport, Ct.

NAILS, Hob—

Star Heel Plate Co., Newark, N. J.

NAILS, Horseshoe—

Capewell Horse Nail Co., Hartford, Ct.
W. M. Mooney & Co., Ausable Chasm, N. Y.
National Horse Nail Co., Vergennes, Vt.
Putnam Horse Nail Co., Neponset, Bos-
ton, Mass.

NAILS, Last—

Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.

NAILS, Picture—

Ossawan Mills Co., Norwich, Ct.

NAILS, Saddle and Lining—

Grand Crossing Tack Co., Grand Crossing,
Ill.
Milwaukee Tack Co., Milwaukee, Wis.

NAILS, Sheathing and Roofing—

Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Son, So. Hanover, Mass.

NAILS, Shoe, Cobblers', Channel, &c.—

Jesse Atherton, Auburn, R. I.
Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
H. J. Miller, Bridgewater, Mass.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Ripley & Bartlett, Plymouth, Mass.
Shelton Co., Derby, Ct.

NAILS, Stay—

Wheeling Hinge Co., Wheeling, W. Va.

NAILS, Wagon, Hinge, &c.—

American Steel & Wire Co., Chicago, Ill.
Diamond Tack & Nail Works, Raynham,
Mass.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Wheeling Hinge Co., Wheeling, W. Va.

NAILS, Wire—

American Screw Co., Providence, R. I.
American Steel & Wire Co., Chicago, Ill.
Dillon-Griswold Wire Co., Sterling, Ill.
Grand Crossing Tack Co., Grand Crossing,
Ill.
Kilmer Wire Mfg. Co., Chicago, Ill.
Lawrence Brothers, Sterling, Ill.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Milwaukee Tack Co., Milwaukee, Wis.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.
Reading Screw Co., Norristown, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers
St., New York.
Geo. W. Stanley Co., Belleville, Ill.
E. H. Titchener & Co., Binghamton, N. Y.
C. C. & E. P. Townsend, New Brighton, Pa.
Wire Goods Co., Worcester, Mass.

**NAILS, Yellow Metal—See Sheathing
Nails, &c., Yellow Metal.****NAME PLATES—See Plates, Name.****NAPKIN RINGS—See Rings, Napkin,
Silver Plated.****NATURAL GAS BURNERS—See Burn-
ers, Natural Gas.****NAVY AND ARMY SCALES—See Scales,
Army and Navy.****NECK YOKE CENTERS, NECK YOKES
—See Centers, Yokes.****NEEDLES, Machine—**

Excelsior Needle Co., Torrington, Ct.

**NEEDLES, Sail Makers', Packing,
&c.—**

W. & J. Tiebout, 118 Chambers St., N. Y.

NEEDLE WIRE—See Wire, Needle.**NESTS, Hens', &c.—**

Gilbert & Bennett Mfg. Co., 42 Cliff St.,
New York.
Wickwire Bros., Cortland, New York.

NETS, Scoop—

W. & J. Tiebout, 118 Chambers St., N. Y.

**NETS, SCOOP, ICE—See Ice Harvest-
ing Tools.****NETTINGS, Canopy—**

I. E. Palmer, Middletown, Ct.

NETTINGS, Mosquito—

I. E. Palmer, Middletown, Ct.

NETTING, Wire—

American Steel & Wire Co., Chicago, Ill.
E. T. Barnum, Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Dow Wire Works Co., Louisville, Ky.
Estey Wire Works Co., 65 Fulton St., N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff St.,
New York.
Howard & Morse, 45 Fulton St., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
New Jersey Wire Cloth Co., Trenton, N. J.
Scheeler's Sons, Buffalo, N. Y.
W. S. Tyler Co., Cleveland, O.
Wickwire Brothers, Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worces-
ter, Mass.

NICKEL—

American Metal Co., 80 Wall St., N. Y.

**NICKEL AND BRASS, ELECTRO
PLATED—See Plating, Electro,
Brass, Nickel, &c.****NICKEL CLOCKS—See Clocks, Nickel.****NICKEL PLATING—See Plating,
Nickel.****NICKELINE—**

Hermann Boker & Co., 101 Duane St., N. Y.

NICKEL, ZINC—See Zinc, Nickel—**NIGHT LATCHES—See Latches, Night.****NIPPERS, Bicycle—**

Utica Drop Forge & Tool Co., Utica, N. Y.
Scovill Mfg. Co., Waterbury, Ct.
J. Stevens Arms & Tool Co., Chicopee
Falls, Mass.

NIPPERS, Cutting—

Bridgeport Mfg. Co., Bridgeport, Ct.
Heller Brothers Co., Newark, N. J.
C. E. Jennings Co., 101 Reade St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St.,
New York.
Star Heel Plate Co., Newark, N. J.
L. S. Starrett Co., Athol, Mass.
Utica Drop Forge & Tool Co., Utica, N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St.,
New York.

NIPPLE BLANK MACHINES, Bicycle—

Waterbury Farrel Foundry & Mach. Co.,
Waterbury, Ct.

**NIPPLE HOLDERS, WRENCHES—See
Holders, Wrenches.****NIPPLES, Automobile—**

Excelsior Needle Co., Torrington, Ct.

NIPPLES, Bicycle—

American Steel & Wire Co., Chicago, Ill.
Excelsior Needle Co., Torrington, Ct.
E. J. Manville Machine Co., Waterbury, Ct.

NOTARY PUBLICS—

Creditors' Legal Union, 302 Broadway,
New York.

**NOTARY SEALS—See Seals, Notary,
&c.****NOTCHING MACHINES, Armature
Disk—**

E. W. Bliss Co., Brooklyn, N. Y.
Long & Allstatter Co., Hamilton, O.
Rudolph & Krummel, Chicago, Ill.

**NOVELTIES, Turned Metal—See
Turned Metal Work.****NOZZLES, Hose—**

Barnes Mfg. Co., Mansfield, O.
Boston Belting Co., Boston, Mass.
Crescent Brass & Iron Co., Detroit, Mich.
Deming Co., Salem, O.
F. E. Myers & Bro., Ashland, O.
Pedrick & Ayer Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Pullman Sash Balance Co., Rochester, N. Y.
I. S. Spencer's Sons, Guilford, Ct.

NOZZLES, Oiler—

Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

**NUT AND BOLT MACHINERY—See Bolt
and Nut Machinery.****NUT BURNING, NUT FACING, NUT
TAPPING MACHINES—See Burring
Machines, Facing Machines, Tap-
ping Machines.****NUT CRACKERS, PICKS, TAPPERS—
See Crackers, Picks, Tappers.**

NUT KEGS—See Kegs, Nail, Bolt, Nut, &c.

NUT MACHINERY—

Ajax Mfg. Co., Cleveland, O.
Bement, Miles & Co., Philadelphia, Pa.
Detrick & Harvey Machine Co., Baltimore.
National Machinery Co., Tiffin, O.
Niles Tool Works Co., Hamilton, O.

NUTMEG GRATES—See Grates, Nutmeg.

NUT PICKS—See Picks, Nut.

NUTS AND WASHERS, Box Rod—

Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.

NUTS, Cap and Brass—

Steward & Romaine Mfg. Co., Philadelphia.

NUTS, Cast Iron—

W. C. Ladd, Bristol, Ct.

NUTS, Knurled—

Pratt & Whitney Co., Hartford, Ct.
T. F. Welch Mfg. Co., Boston, Mass.

NUTS, Lock—

American Iron & Steel Mfg. Co., Lebanon, Pa.
West Side Foundry Co., Troy, N. Y.

NUTS, Pipe Sleeve—

American Iron & Steel Mfg. Co., Lebanon, Pa.

NUTS, Self Locking—

National Elastic Nut Co., Milwaukee, Wisc.

NUTS, Square and Hexagon—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Chicago Screw Co., Chicago, Ill.
Dunham Nut Co., Unionville, Ct.
Sam'l Hall's Sons, 229-233 W. 10th St., New York.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
W. W. Lindsay & Co., Philadelphia, Pa.
Milton Mfg. Co., Milton, Pa.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Works, Rockford, Ill.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Wheeling Hinge Co., Wheeling, W. Va.
Wilson & Smith, Worcester, Mass.

NUTS, Thumb—

Chas. H. Besly & Co., Chicago, Ill.
Chicago Screw Co., Chicago, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Keystone Drop Forge Co., Philadelphia.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Philadelphia Machine Screw Works, Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.
T. F. Welch Mfg. Co., Boston, Mass.

OAKUM—

A. Leschen & Sons Rope Co., St. Louis, Mo.

OAT MEAL MACHINERY—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

OFFICE CHAIRS AND STOOLS—See Chairs and Stools, Office.

OFFICE COUCHES AND SOFAS—See Couches and Sofas, Office.

OFFICE WARDROBES—See Lockers.

OFFICE WIRE—See Wires, Electrical.

OIL AND MOLASSES GATES—See Gates, Oil and Molasses.

OIL CANS, CHANDELIERS, &c.—See Cans, Chandeliers, &c.

OIL CLOTH, PAPER HANGERS', &c., KNIVES—See Knives, Paper Hangers', Oil Cloth, &c.

OIL, CORE—

Cleveland Facing Mill Co., Cleveland, O.
Holland Linseed Oil Co., Chicago, Ill.

OIL DRILLS—See Drills, Oil.

OIL EQUIPMENT, FUEL—See Fuel Oil Equipment.

OILER NOZZLES—See Nozzles, Oiler.

OILERS, Bicycle—

Bowen Mfg. Co., Auburn, N. Y.
Bridgeport Gun Implement Co., 313 Broadway, New York.
Scovill Mfg. Co., Waterbury, Ct.

OILERS, Engineers—

Bowen Mfg. Co., Auburn, N. Y.
Gem Mfg. Co., Pittsburgh, Pa.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

OILERS, Shafting—

Lunkenheimer Company, Cincinnati, O.
Scovill Mfg. Co., Waterbury, Ct.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

OILERS, Spring—

Bowen Mfg. Co., Auburn, N. Y.
Bridgeport Brass Co., Bridgeport, Ct.
Gem Mfg. Co., Pittsburgh, Pa.
Hammer & Co., Branford, Ct.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Edward Miller & Co., Meriden, Ct.
Scovill Mfg. Co., Waterbury, Ct.
Sidney Shepard & Co., Buffalo, N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

OIL, Lubricating—

Chas. H. Besly & Co., Chicago, Ill.

OIL SAVERS—

W. J. Clark Co., Salem, O.

OIL STONE HOLDERS—See Holders, Oil Stone.

OIL WELLS, Machinery for Pumping—See Pumping, Oil Well, Machinery.

OIL WELL SUPPLIES AND TOOLS—See Well Supplies and Tools.

OLD MATERIAL—See Material, Old.

ONYX TABLES—See Tables, Onyx.

OPENERS, Box—

Arcade Mfg. Co., Freeport, Ill.
Bemis & Call Hardware & Tool Co., Springfield, Mass.

OPENERS, Can—

American Cutlery Co., Chicago, Ill.
W. L. Barrett, Bristol, Ct.
Bridgeport Mfg. Co., Bridgeport, Ct.
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Goodell-Pratt Co., Greenfield, Mass.
John H. Graham & Co., 113 Chambers St., New York.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.
New England Specialty Co., North Easton, Mass.
Nicol & Co., Chicago, Ill.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
N. R. Streeter & Co., Rochester, N. Y.
Wrightsville Hardware Co., Wrightsville, Pa.

OPENERS, Cigar Box—

American Cutlery Co., Chicago, Ill.
Erie Specialty Co., Erie, Pa.
John H. Graham & Co., 113 Chambers St., New York.
Nicol & Co., Chicago, Ill.

OPENERS, Egg—

W. R. Hartigan, Collinsville, Ct.

OPENERS, LETTER—

American Cutlery Co., Chicago, Ill.

OPENERS, Sash and Window—

E. A. Ormsby, Melrose, Mass.

ORDER SHEET BINDERS AND HOLDERS—See Binders and Holders, Order Sheet.

ORDNANCE—

Bethlehem Steel Co., South Bethlehem, Pa.

ORE, Chrome—

Reed F. Blair & Co., Pittsburgh, Pa.

ORE CRUSHERS, ROASTING FURNACES, WASHER SCREWS—See Crushers, Furnaces, Screws.

ORE, Iron—

Justice Cox, Jr., & Co., Philadelphia, Pa.
Jerome Keeley & Co., Philadelphia, Pa.
J. Tatnall Lea & Co., Philadelphia, Pa.
B. Nicoll & Co., 66 Wall St., New York.
Pilling & Crane, Philadelphia, Pa.
J. Wesley Pullman, Philadelphia, Pa.
Frank Samuel, Philadelphia, Pa.
W. P. Snyder & Co., Pittsburgh, Pa.
Francis Wister, Philadelphia, Pa.

ORE SHOVELS—See Shovels, Ore.

ORGAN HARDWARE—See Piano and Organ Hardware.

ORNAMENTAL CLOCKS—See Clocks, Ornamental.

ORNAMENTAL SHEET METAL WORK—See Metal Work, Ornamental Sheet.

OVENS, Core—

Byram & Co., Detroit, Mich.
Littleford Bros., Cincinnati, O.
Millett Core Oven Co., Brightwood, Mass.
J. W. Paxson & Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

OVENS, Enameling—

Littleford Bros., Cincinnati, O.

OVENS, Gas, Gasoline and Oil—

Schneider & Trenkamp Co., Cleveland, O.

OVEN STOVES, ENAMELING—See Stoves, Enameling Oven.

OVERHANGING TRACK HOOKS—See Hooks, Overhanging Track.

OVERHEAD TRAMWAYS—See Tramways, Overhead.

OX BALLS, SHOES, YOKES—See Balls, Shoes, Yokes.

OX BOW PINS—See Pins, Ox Bow.

OYSTER KNIVES, RIVETS—See Knives, Rivets.

PACKAGE PROTECTORS—See Protectors, Package.

PACKING BOXES, Wood—See Boxes, Wood Packing.

PACKING, Cup—

Watson-Stillman Co., 204-210 East 43d St., New York.

PACKING, Valve, Rod and Piston—

Boston Belting Co., Boston, Mass.
Fairbanks Co., 311 Broadway, New York.
Jenkins Bros., 71 John St., New York.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Robert Morrison, St. Louis, Mo.
Peerless Rubber Mfg. Co., 16 Warren St., New York.
Silver Lake Co., Boston, Mass.
Watson-Stillman Co., 204-210 East 43d St., New York.

PAD BATHS AND COPYING TANKS—

Globe-Wernicke Co., Cincinnati, O.
Samuel C. Tatum Co., Cincinnati, O.

PAD LOCKS—See Locks, Pad.

PAIL CLASPS, EARS—See Clasps, Ears.

PAIS, Dinner—

Bellaire Stamping Co., Harvey, Ill.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

PAIS, Foundry—

W. J. Clark Co., Salem, O.
Osborn Mfg. Co., Cleveland, O.

PAIS, Galvanized—

Sidney Shepard & Co., Buffalo, N. Y.

PAIS, Sap—

Keen & Hagerty Mfg. Co., Baltimore, Md.

PAIS, Steel—

W. J. Clark Co., Salem, O.

PAIS, Tin—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

PAINT BURNERS, CANS—See Burners, Cans.

- PAINTERS' TRETTLES**—See *Trestles, Painters'.*
- PAINT MACHINERY**—
Robert Poole & Son Co., Baltimore, Md.
- PAINTS, ROOF**—
Garry Iron & Steel Roofing Co., Cleveland, O.
Ironside Co., Columbus, O.
Merchant & Co., Philadelphia, Pa.
- PAINTS, Structural**—
American Steel & Wire Co., Chicago, Ill.
Cleveland Stone Co., Cleveland, O.
Jos. Dixon Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleveland, O.
Ironside Co., Columbus, O.
- PALMS, Sailors' and Sail Makers'**—
W. & J. Tiebout, 118 Chambers St., N. Y.
Union Hardware Co., Torrington, Ct.
- PANEL SAWS**—See *Saws, Hand, Panel, Back, &c.*
- PANS, Acid**—
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
- PANS, Annealing, Lead**—
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- PANS, Cake**—
North Bros. Mfg. Co., Philadelphia, Pa.
- PANS, Candy**—
John Chatillon & Sons, 85 Cliff St., N. Y.
V. Clad & Sons, Philadelphia, Pa.
- PANS, Charging**—
W. J. Clark Co., Salem, O.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
- PANS, Clay Mixing and Ore**—
Thos. Carlin's Sons, Allegheny, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- PANS, Conveyor**—
W. J. Clark Co., Salem, O.
- PANS, Cook, Hot Air**—
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
- PANS, Dripping**—
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.
- PANS, Drying**—
W. J. Clark Co., Salem, O.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
- PANS, Dust**—
Oliver P. Clay Co., Cleveland, O.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.
- PANS, Fry**—
Avery Stamping Co., Cleveland, O.
New York Stamping Co., Brooklyn, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
- PANS, Galvanizing**—
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- PANS, Gem**—
Logan & Strobbridge Iron Co., New Brighton, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
A. C. Williams, Ravenna, O.
- PANS, Grinding**—
Thos. Carlin's Sons, Allegheny, Pa.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- PANS, Medicine**—
W. J. Clark Co., Salem, O.
- PANS, Miners' Gold**—
Sidney Shepard & Co., Buffalo, N. Y.
- PANS, Roasting and Baking**—
Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.
- PANS, Sectional Stew**—
Schneider & Trenkamp Co., Cleveland, O.
- PANS, Shop**—
W. J. Clark Co., Salem, O.
Jeffrey Mfg. Co., Columbus, O.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
- PANS, Stew, Odorless**—
Wilmut & Hobbs Mfg. Co., Bridgeport, Ct.
- PANTRY STEPS**—See *Steps, Pantry.*
- PAPER BAG HOLDERS**—See *Holders, Paper Bag.*
- PAPER BOXES, CUTTING KNIVES, &c.**—See *Boxes, Knives, &c.*
- PAPER CALENDARS**—See *Caleendars, Paper.*
- PAPER, CARD AND BOOK RACKS**—See *Racks, Card, Book and Paper.*
- PAPER CUTTERS**—See *Cutters, Paper.*
- PAPER FILES**—See *Desk Specialties.*
- PAPER HANGERS' KNIVES, SHEARS**—See *Knives, Shears.*
- PAPER MAKERS' SUPPLIES**—
O. S. Kelly Co., Springfield, O.
- PAPER, MICROMETERS FOR**—See *Micrometers, Paper.*
- PAPER, Sand, Garnet, &c.**—
Baeder, Adamson & Co., Philadelphia, Pa.
- PAPER SHELLS, WEIGHTS**—See *Shells, Weights.*
- PARALLEL CLAMPS, RULES, VISES**—See *Clamps, Rules, Vises.*
- PARERS, Apple and Potato**—
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Goodell Co., Antrim, N. H.
Hudson Parer Co., Leominster, Mass.
Reading Hardware Co., Reading, Pa.
- PARERS, Hoof**—
Heller Bros. Co., Newark, N. J.
- PARK FOUNTAINS**—See *Fountains, Park, Lawn, &c.*
- PARTING TOOLS**—See *Tools, Parting.*
- PARTITIONS, Metal**—
Youngstown Iron & Steel Roofing Co., Youngstown, O.
- PASTE, Razors**—
Cattaraugus Cutlery Co., Little Valley, N. Y.
- PATCH BOLTS**—See *Bolts, Patch.*
- PATENT ATTORNEYS**—
Goepel & Raegener, 290 Broadway, N. Y.
Howson & Howson, Philadelphia, Pa.
H. W. T. Jenner, Washington, D. C.
E. B. Stocking, Washington, D. C.
- PATTERN LETTERS**—See *Letters, Pattern.*
- PATTERN MAKERS' DOWELS**—See *Dowels, Pattern Makers'.*
- PATTERN MAKERS' MACHINERY**—
American Machinery Co., Grand Rapids, Mich.
Baker Bros., Toledo, O.
J. A. Fay & Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.
- PATTERN MAKING**—
Automatic Machine Co., Bridgeport, Ct.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
G. Birnbaum, Cleveland, O.
John W. Clark, Albany, N. Y.
Concord Axle Co., Penacook, N. H.
Forest City Foundry & Mfg. Co., Cleveland.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
J. J. Ryan & Co., Chicago, Ill.
Stover Mfg. Co., Freeport, Ill.
Whiting Foundry Equipment Co., Harvey, Ill.
- PATTERN MAKING, Metal**—
Acme Malleable Iron Works, Buffalo, N. Y.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
G. Birnbaum, Cleveland, O.
Palmer & DeMooy Foundry Co., Cleveland.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
J. J. Ryan & Co., Chicago, Ill.
Schwerdtle & Siebert, Bridgeport, Ct.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hardware Co., Cleveland, O.
- PAVING HAMMERS**—See *Hammers, Paving.*
- PAWLS, Ratchet**—
Boston Gear Works, Boston, Mass.
- PEAVEY HOOKS**—See *Hooks, Peavey.*
- PEDAL MACHINES, Bicycle**—
American Tool Works Co., Cincinnati, O.
Garvin Machine Co., Spring & Varick Sts., New York.
Pratt & Whitney Co., Hartford, Ct.
- PEDAL RUBBERS**—See *Rubbers, Pedal.*
- PEDALS, Bicycle**—
Velox Machine Co., Chicago, Ill.
R. H. Wolff & Co., Limited, Foot 116th St., New York.
- PEG AWLS**—See *Awls, Peg.*
- PENCIL ATTACHMENTS, Divider**—
Tower & Lyon, 95 Chambers St., N. Y.
- PENCIL POCKETS**—See *Pockets, Pencil.*
- PENCILS, Lead**—
Jos. Dixon Crucible Co., Jersey City, N. J.
- PENS, Fountain**—
S. F. Myers Co., 48-50 Malden Lane, N. Y.
- PENSTOCKS**—
Wm. B. Pollock Co., Youngstown, O.
R. Poole & Son Co., Baltimore, Md.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Wickes Bros., Saginaw, Mich.
- PEN WIPERS**—See *Desk Specialties, Silver Plated.*
- PEPPERS AND SALTS, Silver Plated**—
International Silver Co., 9-13 Malden Lane, New York.
- PERCUSSION CAPS**—See *Caps, Percussion.*
- PERFORATED BRASS, METAL**—See *Brass, Metal.*
- PERFORATED METAL**—See *Metal Work, Perforated.*
- PERFORATING MACHINES**—
E. W. Bliss Co., Brooklyn, N. Y.
Cross & Speirs Machine Co., Waterbury, Ct.
Erdie & Schenck, Rochester, N. Y.
R. Woodman Mfg. & Supply Co., Boston.
- PEW BOOK RACKS**—See *Racks, Pew Book.*
- PHOSPHATE ROCK MACHINERY**—
Jeffrey Mfg. Co., Columbus, O.
Robert Poole & Son Co., Baltimore, Md.
- PHOSPHORUS**—
Crescent Phosphorized Metal Co., Philadelphia, Pa.
- PHOTO ENGRAVINGS**—See *Engraving, Photo and Wood.*
- PHOTOGRAPH FRAMES**—See *Frames, Photograph, Silver Plated.*
- PHOTOGRAPH TRIMMERS**—See *Trimmers, Photograph.*
- PIANO ACTION MACHINERY**—
Automatic Machine Co., Bridgeport, Ct.
- PIANO AND ORGAN Hardware**—
New Britain Hardware Mfg. Co., New Britain, Ct.
- PIANO BELLINGS, LAMPS**—See *Bellings, Lamps.*
- PIANO PLATES**—
Philadelphia Roll & Machine Co., Philadelphia, Pa.
- PICKERS, Flower and Fruit**—
Acme Shear Co., Bridgeport, Ct.
Edward Darby & Sons, Philadelphia, Pa.
N. R. Streeter & Co., Rochester, N. Y.
- PICKET CHAINS**—See *Chains, Picket.*
- PICKET POINTERS**—
I. S. Spencer's Sons, Guilford, Ct.
- PICKETS, Iron**—
John W. Clark, Albany, N. Y.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

PICKLE CASTERS—See Casters, Silver Plated.

PICKLING MACHINES—

Mesta Machine Co., Pittsburgh, Pa.

PICKS AND AWLS, Ice—

Arcade Mfg. Co., Freeport, Ill.
V. Clad & Sons, Philadelphia, Pa.
Dodge Machine Screw Co., Boston, Mass.
Erie Specialty Co., Erie, Pa.
John H. Graham & Co., 113 Chambers St., New York.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
Norton Mfg. Co., Chester, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Snell Mfg. Co., Fiskdale, Mass.
Stover Mfg. Co., Freeport, Ill.
N. R. Streeter & Co., Rochester, N. Y.
Troy Nickel Works, Albany, N. Y.
Tuck Mfg. Co., Brockton, Mass.
A. C. Williams, Ravenna, O.

PICKS AND MATTOCKS—

Van Wagoner & Williams Hardware Co., Cleveland, O.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.
Wrightsville Hardware Co., Wrightsville, Pa.

PICKS AND PICK EYES, Coal—

Jenkins Iron & Tool Co., Howard, Pa.

PICKS, Nut—

American Cutlery Co., Chicago, Ill.
International Silver Co., 9-13 Maiden Lane, New York.

PICTURE CHAINS, CORD, KNOBS, NAILS—See Chains, Cord, Knobs, Nails.

PICTURE WIRE REELS—See Reels, Picture Wire.

PIE RACKS, TINS—See Racks, Tins.

PIGEON HOLE CASES—See Cases, Pigeon Hole.

PIGEONS, Clay—

Markle Lead Works, St. Louis, Mo.

PIG IRON CASTING MACHINES—See Casting Machines, Pig Iron.

PILE DRIVERS' SAWS—See Drivers, Saws.

PIN BREAK ARMS—

I. S. Spencer's Sons, Guilford, Ct.

PINCERS—

Heller Bros. Co., Newark, N. J.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Star Heel Plate Co., Newark, N. J.

PINCH BARS—See Pushers, Car.

PINION CUTTERS, Automatic—

Dwight Slate Machine Co., Hartford, Ct.
Philadelphia Roll & Machine Co., Philadelphia, Pa.

PINIONS, Roll—

A. Garrison Foundry Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Seaman-Sleeth Co., Pittsburgh, Pa.

PINKING ROLLS, RAWHIDE—See Rolls, Rawhide Pinking.

PIN MACHINERY—

Automatic Machine Co., Bridgeport, Ct.

PIN MACHINES, Safety—

E. J. Manville Machine Co., Waterbury, Ct.

PINS AND LINKS, Car Coupling—See Links and Pins, Car Coupling.

PINS, Belaying—

Boston & Lockport Block Co., Boston.
W. & J. Tiebout, 118 Chambers St., N. Y.

PINS, Clothes—

J. R. Clark Co., Minneapolis, Minn.
United States Clothes Pin Co., Montpelier, Vt.

PINS, Crank—

Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Elwood City, Pa.

PINS, Dowel—

Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. H. Titchener & Co., Binghamton, N. Y.

PINS, Drapery—

Ossawan Mills Co., Norwich, Ct.

PINS, Escutcheon, Brass and Iron—

American Steel & Wire Co., Chicago, Ill.
Bridgeport Brass Co., Bridgeport, Ct.
Grand Crossing Tack Co., Grand Crossing, Ill.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Milwaukee Tack Co., Milwaukee, Wis.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Scovill Mfg. Co., Waterbury, Ct.
Wire Goods Co., Worcester, Mass.

PINS, Ox Bow—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

PINS, Rolling—

John Sommer's Son, Newark, N. J.

PINS, Safety—

A. H. Nilson Machine Co., Bridgeport, Ct.

PINS, Sash—

Grand Crossing Tack Co., Grand Crossing, Ill.
W. & J. Tiebout, 118 Chambers St., N. Y.

PINS, Shelf—

Norwalk Lock Co., South Norwalk, Ct.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PINS, Taper—

Morse Twist Drill & Machine Co., New Bedford, Mass.
Worcester Machine Screw Co., Worcester, Mass.

PINS, TEN—See Ten Pins and Balls.

PIN WIRE—See Wire, Pin.

PIPE, Brass and Copper—See Tubing, Brass and Copper.

PIPE, Cast Iron—

Chas. Millar & Son, Utica, N. Y.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Foundry Co., Ltd., Reading, Pa.
United States Cast Iron Pipe & Foundry Co., Philadelphia, Pa.
Virginia Iron, Coal & Coke Co., Bristol, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
Whiting Foundry Equipment Co., Harvey, Ill.
R. D. Wood & Co., Philadelphia, Pa.

PIPE COILS, CUTTERS, &c.—See Coils, Cutters, &c.

PIPE, CONDUCTOR—See Conductor Pipe.

PIPE CUTTING AND THREADING MACHINES—

Armstrong Mfg. Co., Bridgeport, Ct.
Bignall & Keefer Mfg. Co., Edwardsville, Ill.
Curtis & Curtis, Bridgeport, Ct.
Detrick & Harvey Machine Co., Baltimore.
Fairbanks Co., 311 Broadway, New York.
Fox Machine Co., Grand Rapids, Mich.
Hill, Clarke & Co., Boston, Mass.
Jarecki Mfg. Co., Erie, Pa.
Merrell Mfg. Co., Toledo, O.
P. Hollingsworth Morris, Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Oster Mfg. Co., Cleveland, O.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
D. Saunders' Sons, Yonkers, N. Y.

PIPE HANGER TONGS—See Tongs, Pipe Hanger.

PIPE HOOK PLATES, STEEL—See Plates, Pipe Hook, Steel.

PIPE, Lead—

Chas. Millar & Son, Utica, N. Y.

PIPE, Merchant—

National Tube Co., Pittsburgh, Pa.
Frank Samuel, Philadelphia, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.

PIPE PLANTS, Riveted—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Hilles & Jones Co., Wilmington, Del.
Wm. B. Scaife & Sons, Pittsburgh, Pa.

PIPE, Riveted Steel—

Lee-Odlum Boiler Co., Memphis, Tenn.
W. B. Pollock Co., Youngstown, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Statler-Bischoff Co., Chicago, Ill.
Warren City Boiler Works, Warren, O.

PIPES, Blow—

Braunsdorf-Mueller Co., Elizabeth, N. J.

PIPES, Chain—

W. & J. Tiebout, 118 Chambers St., N. Y.

PIPE, Sewer—

Chas. Millar & Son, Utica, N. Y.

PIPES, Flush and Supply—

Crescent Brass & Iron Co., Detroit, Mich.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Randolph-Clowes Co., Waterbury, Ct.

PIPE SLEEVE NUTS—See Nuts, Pipe Sleeve.

PIPE, Steel—

Avery Stamping Co., Cleveland, O.
W. J. Clark Co., Salem, O.
Barclay W. Cotton & Co., Philadelphia, Pa.
Littleford Bros., Cincinnati, O.
National Tube Co., Pittsburgh, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Statler-Bischoff Co., Chicago, Ill.

PIPE, Stove—

S. M. Howe Co., Boston, Mass.

PIPE STRAINERS, CONDUCTOR—See Strainers, Conductor Pipe.

PIPE UNIONS—See Unions, Pipe.

PIPE WRENCHES, Adjustable S—See Wrenches, Adjustable S Pipe.

PIPE, Wrought Iron—See Pipe, Merchant.

PIPING WORK, Galvanized—

B. F. Sturtevant Co., Boston, Mass.

PISTOL POCKETS, Rubber—See Pockets, Pistol, Rubber.

PISTOLS AND REVOLVERS—

Ames Sword Co., Chicopee, Mass.
Harrington & Richardson Arms Co., Worcester, Mass.
Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
Marlin Fire Arms Co., New Haven, Ct.
Remington Arms Co., 313 Broadway, N. Y.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

PISTON PACKING, RINGS, RODS—See Packing, Rings, Rods.

PITCHERS, Beer, Wine, Syrup, &c., Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

PITCHERS, Metal—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Rome Mfg. Co., Rome, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.

PITCHER SPOUT PUMPS—See Pumps, Cistern, Pitcher Spout, &c.

PITS, Soaking—

G. W. McClure & Son, Pittsburgh, Pa.
Wm. Swindell & Bros., Pittsburgh, Pa.

PIVOTS, Door—

Lawson Mfg. Co., Milwaukee, Wis.

PLANE GAUGES, IRONS, HANDLES—See Gauges, Irons, Handles.

PLANE IRONS, TOY—See Toy Plane Irons.

PLANNER CENTERS, CHUCKS, &c.—See Centers, Chucks, &c.

PLANNER KNIFE FILES, GRINDERS—See Files, Grinders.

PLANERS, Buzz—

American Machinery Co., Grand Rapids, Mich.
Hill, Clarke & Co., Boston, Mass.
Niles Tool Works Co., Hamilton, O.

PLANERS, Electric Wood—

Thos. H. Dallett & Co., Philadelphia, Pa.

PLANERS, Metal—

American Tool Works Co., Cincinnati, O.
 U. Baird Machinery Co., Pittsburgh, Pa.
 Bement, Miles & Co., Philadelphia, Pa.
 Cincinnati Planer Co., Cincinnati, O.
 Detrick & Harvey Machine Co., Baltimore.
 Draper Machine Tool Co., Worcester, Mass.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Gleason Tool Co., Rochester, N. Y.
 Edwin Harrington, Son & Co., Philadelphia, Pa.
 Hendey Machine Co., Torrington, Ct.
 Henry F. Hill, Boston, Mass.
 Hill, Clarke & Co., Boston, Mass.
 Hilles & Jones Co., Wilmington, Del.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 Marshall & Husehart Machinery Co., Chicago, Ill.
 J. J. McCabe, 14 Dey St., New York.
 New Haven Mfg. Co., New Haven, Ct.
 Niles Tool Works Co., Hamilton, O.
 Norton Mfg. Co., Muskegon Heights, Mich.
 Pedrick & Ayer Co., Philadelphia, Pa.
 Pennsylvania Machinery Co., Philadelphia, Pa.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Frank Toomey, Philadelphia, Pa.
 Whitcomb Mfg. Co., Worcester, Mass.
 William Sellers & Co. (Inc.), Philadelphia.
 W. A. Wilson, Rochester, N. Y.
 S. M. York Co., Cleveland, O.

PLANERS, MITER—See Miter Planers.**PLANERS, Open Side—**

Detrick & Harvey Machine Co., Baltimore.
 Pedrick & Ayer Co., Philadelphia, Pa.

PLANERS, Plate—

Bement, Miles & Co., Philadelphia, Pa.
 Hilles & Jones Co., Wilmington, Del.
 Niles Tool Works Co., Hamilton, O.
 Pedrick & Ayer Co., Philadelphia, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

PLANERS, Rotary—

Bement, Miles & Co., Philadelphia, Pa.
 Lucas & Gliem, Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

PLANERS, Stone—

Farrel Foundry & Mach. Co., Ansonia, Ct.
 Hill, Clarke & Co., Boston, Mass.
 F. R. Patch Mfg. Co., Rutland, Vt.

PLANERS, Wall—

Bement, Miles & Co., Philadelphia, Pa.

PLANERS, Wood—

American Machinery Co., Grand Rapids, Mich.
 J. A. Fay & Co., Cincinnati, O.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Hill, Clarke & Co., Boston, Mass.
 Niles Tool Works Co., Hamilton, O.

PLANES, ICE—See Ice Harvesting Tools.**PLANES, Iron—**

Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
 Stanley Rule & Level Co., New Britain, Ct.
 Tower & Lyon, 95 Chambers St., N. Y.

PLANES, Wood—

Stanley Rule & Level Co., New Britain, Ct.

PLANIMETERS—

Ashton Valve Co., Boston, Mass.

PLANING MACHINES, Armor Plate—

Bement, Miles & Co., Philadelphia, Pa.

PLANING MACHINES, Connecting Rod—

Bement, Miles & Co., Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

PLANING MILL MACHINERY—

American Machinery Co., Grand Rapids, Mich.
 J. A. Fay & Co., Cincinnati, O.
 Josiah Ross, Buffalo, N. Y.
 Wickes Bros., Saginaw, Mich.

PLANISHING MACHINES—

A. H. Merriman, Meriden, Ct.

PLANTATION CHECKS—See Checks, Plantation.**PLANTERS, Corn—**

Janesville Hay Tool Co., Janesville, Wis.
 F. E. Kohler & Co., Canton, O.
 Variety Machine Co., Warsaw, N. Y.

PLANTERS, Cotton—

R. W. Whitehurst & Co., Norfolk, Va.

PLANTERS, Potato—

Aspinwall Mfg. Co., Jackson, Mich.

PLANT LABELS—See Labels, Plant or Tree.**PLASTERING TROWELS—See Trowels, Brick, Plastering, &c.****PLASTER RETAINERS—**

Pullman Sash Balance Co., Rochester, N. Y.

PLATE, Black, for Tinning—

Champion Iron & Steel Co., Muskegon, Mich.
 F. R. Phillips' Sons Co., Philadelphia, Pa.

PLATE CASTERS, HINGES—See Casters, Hinges.**PLATE HANDLERS, WIRE—See Household Articles, Wire.****PLATERS' METAL—See Metal, Platers' or Gold.****PLATES AND HOOKS, Window—**

Norwalk Lock Co., South Norwalk, Ct.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PLATES AND STUBS, STORE SHUTTER—See Stubs and Plates, Store Shutter.**PLATES AND WASHERS, Floor—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Plume & Atwood Mfg. Co., Waterbury, Ct.

PLATES, Bolster—

John C. Kupferle, St. Louis, Mo.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Republic Iron & Steel Co., Chicago, Ill.
 Stover Mfg. Co., Freeport, Ill.

PLATES, Brass Step—

W. & J. Tiebout, 118 Chambers St., N. Y.

PLATES, Car Door—

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PLATES, Ceiling—

Houghton & Buxton Mfg. Co., Worcester, Mass.

PLATES, Charcoal Iron Boiler—

Seidel & Hastings Co., Wilmington, Del.

PLATES, Deck or Man Hole—

Edson Mfg. Co., Boston, Mass.
 W. & J. Tiebout, 118 Chambers St., N. Y.

PLATES, Die—

Butterfield & Co., Derby Line, Vt.

PLATES, Drop Letter—

Nicol & Co., Chicago, Ill.
 Norwalk Lock Co., South Norwalk, Ct.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PLATES, Fellow—

Avery Stamping Co., Cleveland, O.
 W. J. Clark Co., Salem, O.
 Houghton & Buxton Mfg. Co., Worcester, Mass.
 McKinney Mfg. Co., Allegheny, Pa.
 Nut & Washer Mfg. Co., Milwaukee, Wis.
 Wheeling Hinge Co., Wheeling, W. Va.
 Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

PLATES, Fish—

American Steel & Wire Co., Chicago, Ill.
 Illinois Steel Co., Chicago, Ill.
 Pierson & Co., 29 Broadway, N. Y.
 Republic Iron & Steel Co., Chicago, Ill.

PLATES, Floor and Ceiling—

Codling Mfg. Co., Bristol, Ct.
 Houghton & Buxton Mfg. Co., Worcester, Mass.

PLATES, Heel—

Star Heel Plate Co., Newark, N. J.

PLATES, Hinge, Corner and Center—

Norwalk Lock Co., South Norwalk, Ct.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PLATES, Hot—

Schnelder & Trenkamp Co., Cleveland, O.
 Taylor & Boggis Foundry Co., Cleveland.

PLATES, Hound—

John C. Kupferle, St. Louis, Mo.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.

PLATES, Iron and Steel—

American Steel & Wire Co., Chicago, Ill.
 Barclay W. Cotton & Co., Philadelphia, Pa.
 Justice Cox, Jr., Philadelphia, Pa.
 Danville Bessemer Co., Danville, Pa.
 J. W. Hoffman & Co., Philadelphia, Pa.
 C. B. Houston & Co., Philadelphia, Pa.
 Illinois Steel Co., Chicago, Ill.
 Henry Levis & Co., Philadelphia, Pa.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Chas. E. McInnes & Co., Philadelphia, Pa.
 John B. Newkirk & Co., Philadelphia, Pa.
 B. Nicoll & Co., 66 Wall St., New York.
 Nicolls, Wheeler & Co., Philadelphia, Pa.
 Ogden & Wallace, 577 Greenwich St., N. Y.
 Otis Steel Co., Ltd., Cleveland, O.
 Pierson & Co., 29 Broadway, New York.
 Horace T. Potts & Co., Philadelphia, Pa.
 Republic Iron & Steel Co., Chicago, Ill.
 Seidel & Hastings Co., Wilmington, Del.
 Singer, Nimick & Co., Inc., Pittsburgh.
 E. H. Stroud & Co., Chicago, Ill.
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
 W. H. Thomas & Co., Philadelphia, Pa.
 Tidewater Steel Co., Philadelphia, Pa.
 Wm. H. Wallace & Co., 66 Broadway, N. Y.
 Alan Wood Co., Philadelphia, Pa.

PLATES, Mending—

Stanley Works, New Britain, Ct.
 Wilcox Mfg. Co., Aurora, Ill.

PLATES, Name—

American Railway Supply Co., 24 Park Place, New York.
 Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Ct.
 L. A. Eucker Stamp Works, Little Ferry, N. J.
 H. H. Franklin Mfg. Co., Syracuse, N. Y.
 Murdock Parlor Grate Co., Boston, Mass.
 Geo. M. Ness, Jr., 61 Fulton St., New York.
 Norwalk Lock Co., South Norwalk, Ct.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Scovill Mfg. Co., Waterbury, Ct.
 Schwerdtle & Siebert, Bridgeport, Ct.
 I. S. Spencer's Sons, Guilford, Ct.
 R. Woodman Mfg. & Supply Co., Boston.

PLATES, Pipe Hook, Steel—

Avery Stamping Co., Cleveland, O.

PLATES, Plow—

Wheeling Hinge Co., Wheeling, W. Va.

PLATES, Push, Pull and Kick—

Bommer Bros., Brooklyn, N. Y.
 Chicago Spring Butt Co., Chicago, Ill.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Stover Mfg. Co., Freeport, Ill.
 Taylor & Boggis Foundry Co., Cleveland.

PLATES, Safe Burglar Proof—

Chrome Steel Works, Brooklyn, N. Y.

PLATES, Screw—

Billings & Spencer Co., Hartford, Ct.
 Butterfield & Co., Derby Line, Vt.
 S. W. Card Mfg. Co., Mansfield, Mass.
 Champion Blower & Forge Co., Lancaster, Pa.
 Morse Twist Drill & Machine Co., New Bedford, Mass.
 Pratt & Whitney Co., Hartford, Ct.
 E. F. Reece Co., Greenfield, Mass.
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.

PLATES, Stair—

U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.

PLATES, VENTILATING—See Iron Work, Builders'.**PLATES, Whitetree—**

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

PLATE, Tin and Terne—

American Tin Plate Co., Battery Park Building, New York.
 Champion Iron & Steel Co., Muskegon, Mich.
 Garry Iron & Steel Roofing Co., Cleveland, O.
 Merchant & Co., Philadelphia, Pa.
 F. R. Phillips' Sons Co., Philadelphia, Pa.
 E. H. Stroud & Co., Chicago, Ill.

PLATFORM SCALES—See Scales, Platform.**PLATING, Electro—**

Albany Foundry Co., Albany, N. Y.
 Blackman & King, 801 Greenwich St., N. Y.
 J. W. Clark, Albany, N. Y.
 Crescent Brass & Iron Co., Detroit, Mich.
 Empire Pipe Bending & Supply Co., Brooklyn, N. Y.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Murdock Parlor Grate Co., Boston, Mass.
 New Britain Hardware Mfg. Co., New Britain, Ct.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 J. J. Ryan & Co., Chicago, Ill.
 I. S. Spencer's Sons, Guilford, Ct.
 Stover Mfg. Co., Freeport, Ill.
 Taylor & Boggis Foundry Co., Cleveland.

PLATING, Nickel—

Albany Foundry Co., Albany, N. Y.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 J. W. Clark, Albany, N. Y.
 Crescent Brass & Iron Co., Detroit, Mich.

PLATING SUPPLIES, ELECTRO—See Electro Plating Supplies.**PLATINUM—**

Elmer & Amend, 205 3d Ave., New York.

PLIERS—

Athol Machine Co., Athol, Mass.
 Billings & Spencer Co., Hartford, Ct.
 Bridgeport Mfg. Co., Bridgeport, Ct.
 C. E. Jennings Co., 101 Reade St., N. Y.
 J. M. King & Co., Waterford, N. Y.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Smith & Egge Mfg. Co., Bridgeport, Ct.
 Tower & Lyon, 95 Chambers St., N. Y.
 Utica Drop Forge & Tool Co., Utica, N. Y.

PLIERS, Combination—

Bridgeport Mfg. Co., Bridgeport, Ct.
 Metropolitan Daylight Lamp Co., Chicago, Ill.
 Utica Drop Forge & Tool Co., Utica, N. Y.

PLOW BOLTS, CASTINGS, COLTERS, &c.—See Bolts, Castings, Colters, &c.**PLOW HANDLE MACHINES—See Handle Machines, Plow.****PLOWS—**

American Steel Scraper Co., Sidney, O.
 W. C. Heller & Co., Montclair N. J.
 Kilbourne & Jacobs Mfg. Co., Columbus, O.
 Long & Allstatter Co., Hamilton, O.
 Orangeville Agricultural Works & Foundry, Orangeville, Pa.
 Sidney Steel Scraper Co., Sidney, O.
 Syracuse Chilled Plow Co., Syracuse, N. Y.
 R. W. Whitehurst & Co., Norfolk, Va.
 J. K. Wilder & Sons, Monroe, Mich.

PLOWS, ICE—See Ice Harvesting Tools.**PLOWS, Street Railroad, Snow—**

Taunton Locomotive Mfg. Co., Taunton, Mass.

PLUG GAUGES—See Gauges, Plug and Ring.**PLUGS, Roll Turning—**

Samuel Trethewey & Co., Pittsburgh, Pa.

PLUMBAGO—See Graphite.**PLUMB BOBS—See Bobs, Plumb.****PLUMBERS' FURNACES, LEVELS, &c.—See Furnaces, Levels, &c.****PLUMBING BRACKETS—See Brackets, Plumbing.****PLUMBING SUPPLIES (Plunger Rubbers, Legs and Lavatory Fittings, Basin Plugs, &c.)—**

H. O. Canfield, Bridgeport, Ct.
 Crescent Brass & Iron Co., Detroit, Mich.
 John C. Kupferle, St. Louis, Mo.
 Chas. Millar & Son, Utica, N. Y.
 Pleuger & Henger Mfg. Co., St. Louis Mo.
 Randolph-Clowes Co., Waterbury, Ct.
 Smith & Egge Mfg. Co., Bridgeport, Ct.
 See also *Gaskets and Rings*.

PLUMBS AND LEVELS—

Henry Disston & Sons, Philadelphia, Pa.
 Millers Falls Co., 28 Warren St., N. Y.
 Stanley Rule & Level Co., New Britain, Ct.
 Tower & Lyon, 95 Chambers St., N. Y.

PLUMES, Horse and Sleigh—

Bevin Bros. Mfg. Co., East Hampton, Cts.
 Starr Brothers Bell Co., East Hampton, Ct.

PLUNGER RUBBERS—See Plumbing Supplies.**PNEUMATIC CALL BELLS, HAMMERS, &c.—See Bells, Hammers, &c.****PNEUMATIC TOOLS—See Compressed Air Tools.****POACHERS, Egg—**

Sidney Shepard & Co., Buffalo, N. Y.

POCKET COMPASSES, CUPS, &c.—See Compasses, Cups, &c.**POCKET KNIVES—See Cutlery, Pocket.****POCKETS, Pencil—**

Nicol & Co., Chicago, Ill.

POCKETS, Pistol, Rubber—

Tower & Lyon, 95 Chambers St., N. Y.

POD BITS—See Bits, Pod.**POINTERS, Bolt—**

Asa S. Cook Co., Hartford, Ct.
 National Machinery Co., Tiffin, O.

POINTERS, Pencil—

Goodell Co., Antrim, N. H.

POINTERS, PICKET—See Picket Pointers.**POINTERS, Spoke—**

Defiance Machine Works, Defiance, O.
 Millers Falls Co., 28 Warren St., New York.

POINTING MACHINES, Rod and Tube—

Excelsior Needle Co., Torrington, Ct.
 Henderson Bros., Waterbury, Ct.
 Mossberg & Granville Mfg. Co., Providence, R. I.

POINTING MACHINES, Wire—

Bates Machine Co., Joliet, Ill.
 Excelsior Needle Co., Torrington, Ct.
 Morgan Construction Co., Worcester, Mass.
 Trenton Iron Co., Trenton, N. J.
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
 T. F. Welch Mfg. Co., Boston, Mass.

POINTS, Glaziers', &c.—

Jesse Atherton, Auburn, R. I.
 Grand Crossing Tack Co., Grand Crossing, Ill.
 Shelton Co., Derby, Ct.

POINTS, TRAMMEL—See Trammels and Trammel Points.**POINTS, WELL—See Well Supplies and Tools.****POKERS, Stove—**

Logan & Strobbridge Iron Co., New Brighton, Pa.
 Nicol & Co., Chicago, Ill.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 See also *Shovels, Tongs, Pokers, Fire Sets*.

POKES, Animal—

Iowa Farming Tool Co., Fort Madison, Ia.

POLE ADJUSTERS, STEPS, TIPS—See Adjusters, Steps, Tips.**POLES, Trolley—**

Shelby Steel Tube Co., Cleveland, O.

POLICE GOODS—

Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
 Tower & Lyon, 95 Chambers St., N. Y.

POLISH, Furniture—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

POLISHING AND BUFFING SUPPLIES—

L. Best, 45 Vesey St., New York.
 Diamond Machine Co., Providence, R. I.
 Divine Bros. Co., Utica, N. Y.
 Hanson & Van Winkle Co., Newark, N. J.
 Maxwell M. Mayer Electric Co., 2d Ave. & 121st St., New York.
 Mendes Cutting Factories, 14 John St., New York.
 Sterling Emery Wheel Co., Tiffin, O.
 Tanite Co., Stroudsburg, Pa.
 Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

POLISHING BELTS, HEADS, WHEELS—See Belts, Heads, Wheels.**POLISHING MACHINES—See Buffing and Polishing Machines.****POLISHING MACHINES, Glass—**

Stow Flexible Shaft Co., Philadelphia, Pa.

POLISHING MACHINES, Marble and Stone—

F. R. Patch Mfg. Co., Rutland, Vt.

POLISHING MACHINES, Portable Wood and Metal—

L. Best, 45 Vesey St., New York.
 Concord Axle Co., Penacook, N. H.
 Pawling & Harnischfeger, Milwaukee, Wis.
 Stow Flexible Shaft Co., Philadelphia, Pa.

POLISH, Metal—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
 Geo. W. Hoffman, Indianapolis, Ind.

POPPERS, Corn—

Edward Darby & Sons, Philadelphia, Pa.
 Estey Wire Works Co., 65 Fulton St., N. Y.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Sidney Shepard & Co., Buffalo, N. Y.
 Wickwire Bros., Cortland, N. Y.

PORCH SUPPORTS—See Supports, Porch.**PORTABLE BORING MACHINES, DRILLS, &c.—See Boring Machines, Drills, &c.****PORTABLE FURNACES—See Furnaces, Portable.****PORTICOES, ORNAMENTAL—See Iron Work, Builders'.****POSTAL SCALES—See Scales, Postal.****POST BASES, Fence—**

Van Dorn Iron Works Co., Cleveland, O.

POST CAPS, Fence—

Van Dorn Iron Works Co., Cleveland, O.

POST HOLE DIGGERS—See Diggers.**POST HOLE SPADES—**

St. Louis Shovel Co., St. Louis, Mo.

POSTS, Fence—

W. J. Adam, Joliet, Ill.
 Avery Stamping Co., Cleveland, O.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 De Kalb Fence Co., De Kalb, Ill.
 Dwiglins Wire Fence Co., Anderson, Ind.
 Ellis & Halfenberger, Indianapolis, Ind.
 Hartman Mfg. Co., Ellwood City, Pa.
 Statler-Bischoff Co., Chicago, Ill.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
 Up-to-Date Mfg. Co., Terre Haute, Ind.
 Wright & Colton Wire Cloth Co., Worcester, Mass.

POSTS, Hitching—

E. T. Barnum, Detroit, Mich.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Covert Mfg. Co., West Troy, N. Y.
 Edward Darby & Sons, Philadelphia, Pa.
 Ellis & Halfenberger, Indianapolis, Ind.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 Hartman Mfg. Co., Ellwood City, Pa.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Ludlow-Saylor Wire Co., St. Louis, Mo.

Fred. J. Meyers Mfg. Co., Hamilton, O.
National Iron & Wire Co., Cleveland, O.
Stewart Iron Works, Cincinnati, O.
Up-to-Date Mfg. Co., Terre Haute, Ind.
Van Dorn Iron Works Co., Cleveland, O.
West Side Foundry Co., Troy, N. Y.

POSTS, Lamp—

Wm. Bayley & Sons Co., Milwaukee, Wis.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Reading Foundry Co., Reading, Pa.
Stewart Iron Works, Cincinnati, O.
R. D. Wood & Co., Philadelphia, Pa.

POSTS, Mooring—

R. W. Whitehurst & Co., Norfolk, Va.

POST TOPS, Fence—

De Kalb Fence Co., De Kalb, Ill.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

POST TOPS, Hitching—

Wm. Bayley & Sons Co., Milwaukee, Wis.
Stover Mfg. Co., Freeport, Ill.

POTATO AND APPLE PARERS—See Parers, Apple and Potato.**POTATO CUTTERS—See Cutters, Potato.****POTATO HOOKS, MASHERS—See Hooks, Mashers.****POTATO MACHINERY—See Machinery, Potato.****POTATO MASHERS, WIRE—See Kitchen Articles, Wire.****POTATO PEELING MACHINES—**

V. Clad & Sons, Philadelphia, Pa.

POT COVERS—See Covers, Pot.**POTS, Chocolate, Tea, Coffee, &c., Silver Plated.**

International Silver Co., 9-13 Maiden Lane, New York.

POTS, Slag—

Edw. P. Allis Co., Milwaukee, Wis.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.

POTS, Solder and Molds—

John C. Kupferle, St. Louis, Mo.

POTS, Sprinkler—See Tinware, Picked and Stamped.**POTS, Tallow—**

Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

POTS, Tea and Coffee—

Bellaire Stamping Co., Harvey, Ill.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Rome Mfg. Co., Rome, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

POTTERY MACHINERY—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

POUCHES, Shot—

Waterbury Brass Co., Waterbury, Ct.

POULTRY COOPS—See Coops, Poultry.**POULTRY LEG BANDS—See Markers, Poultry and Leg Bands.****POULTRY NETTING—See Netting, Wire.****POUNDERS, Steak—**

R. H. Brown & Co., New Haven, Ct.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Rule & Level Co., New Britain, Ct.
N. R. Streeter & Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Wrightsville Hardware Co., Wrightsville, Pa.

POWDER—

King Powder Co., Cincinnati, O.

POWDER BOXES—See Boxes, Silver Plated.**POWDER FLASKS—See Flasks, Powder.****POWDER MILL TOOLS—**

Phosphor-Bronze Smelting Co., Philadelphia, Pa.

POWERS, Horse—

Janesville Hay Tool Co., Janesville, Wis.
Orangeville Agricultural Works & Foundry, Orangeville, Pa.
J. K. Wilder & Sons, Monroe, Mich.

POWER TRANSMISSION, Electric—

Eddy Electric Mfg. Co., Windsor, Ct.
General Electric Co., Schenectady, N. Y.

POWER TRANSMISSION MACHINERY—

E. P. Allis Co., Milwaukee, Wis.
Aultman Co., Canton, O.
Braddock Machine & Mfg. Co., Braddock, Pa.
Buhl Malleable Co., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
Filler & Stowell Co., Milwaukee, Wis.
Heyl & Patterson, Pittsburgh, Pa.
F. W. Iredell, 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.
James Leffel & Co., Springfield, O.
Robert Poole & Son Co., Baltimore, Md.
Saginaw Mfg. Co., Saginaw, Mich.
Variety Machine Co., Warsaw, N. Y.
Wickes Bros., Saginaw, Mich.

POWER TRANSMISSION, Vertical Shaft—

Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.

PRECIOUS STONES, Dealers in—

Mendes Cutting Factories, 14 John St., New York.

PRESSES, Arbor—

Seneca Falls Mfg. Co., Seneca Falls, N. Y.

PRESSES, Baling—

Famous Mfg. Co., Chicago, Ill.
Watson-Stillman Co., 204-210 East 43d St., New York.
R. W. Whitehurst & Co., Norfolk, Va.

PRESSES, Blanking—

Blake & Johnson, Waterbury, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Cleveland Stamping & Tool Co., Cleveland.
Ferracute Machine Co., Bridgeton, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Chas. Leffler & Co., Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Philadelphia Machine Tool Co., Philadelphia, Pa.

PRESSES, Brick—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

PRESSES, Broaching—

E. W. Bliss Co., Brooklyn, N. Y.
W. H. Hibbard, Brooklyn, N. Y.
Mossberg & Granville Mfg. Co., Providence, R. I.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
Rudolphi & Krummel, Chicago, Ill.
Watson-Stillman Co., 204-210 East 43d St., New York.

PRESSES, Ceiling—

Philadelphia Machine Tool Co., Philadelphia, Pa.

PRESSES, COINING—See Coining Machinery.**PRESSES, Copying—**

R. E. Kidder, Worcester, Mass.
Sam'l C. Tatum Co., Cincinnati, O.
Whitcomb Mfg. Co., Worcester, Mass.

PRESSES, Cork—

Enterprise Mfg. Co., Philadelphia, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PRESSES, Cornice—

Philadelphia Machine Tool Co., Philadelphia, Pa.

PRESSES, Cotton—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
R. W. Whitehurst & Co., Norfolk, Va.

PRESSES, Cutting and Finishing—

R. Bliss Mfg. Co., Pawtucket, R. I.
Niagara Machine & Tool Works, Buffalo, N. Y.

PRESSES, Drain Tiles—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

PRESSES, Drawing—

Adriance Machine Works, Brooklyn, N. Y.
Avery Stamping Co., Cleveland, O.
E. W. Bliss Co., Brooklyn, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Gould & Eberhardt, Newark, N. J.
W. H. Hibbard, Brooklyn, N. Y.
A. H. Merriman, Meriden, Ct.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Richard Mfg. Co., Bloomsburg, Pa.
Rudolphi & Krummel, Chicago, Ill.
F. B. Shuster Co., New Haven, Ct.
Watson-Stillman Co., 204-210 East 43d St., New York.

PRESSES, Drop—

Billings & Spencer Co., Hartford, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
Cross & Speirs Machine Co., Waterbury, Ct.
Danielson Machine & Tool Co., Cleveland, O.
Gould & Eberhardt, Newark, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Marshall & Huschart Machinery Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works, Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.
Woolley Foundry & Machine Co., Anderson, Ind.

PRESSES, Electrotypes—

Watson-Stillman Co., 204-210 East 43d St., New York.

PRESSES, Filter—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.

PRESSES, Flanging—

Bement, Miles & Co., Philadelphia, Pa.
E. W. Bliss Co., Brooklyn, N. Y.
T. W. G. Cook, 4 Reade St., New York.
W. H. Hibbard, Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.
Watson-Stillman Co., 204-210 East 43d St., New York.

PRESSES, Foot—

Blake & Johnson, Waterbury, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
T. W. G. Cook, 4 Reade St., New York.
Cross & Speirs Machine Co., Waterbury, Ct.
Erdle & Schenck, Rochester, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Garvin Machine Co., Spring & Varick Sts., New York.
Gould & Eberhardt, Newark, N. J.
W. H. Hibbard, Brooklyn, N. Y.
Hill, Clarke & Co., Boston, Mass.
Chas. E. Leffler & Co., Brooklyn, N. Y.
John Loyd, 558 Water St., New York.
E. J. Manville Machine Co., Waterbury, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.
A. B. Pitkin Machinery Co., Providence, R. I.
F. B. Shuster Co., New Haven, Ct.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

PRESSES, Forging—

Avery Stamping Co., Cleveland, O.
Beaudry & Co., Boston, Mass.
Blake & Johnson, Waterbury, Ct.
E. W. Bliss Co., Brooklyn, N. Y.
T. W. G. Cook, 4 Reade St., New York.
W. H. Hibbard, Brooklyn, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.

Philadelphia Machine Tool Co., Philadelphia, Pa.
 Rudolph & Krummel, Chicago, Ill.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Watson-Stillman Co., 204-210 East 43d St., New York.

PRESSES, Fruit and Meat—

Athol Machine Co., Athol, Mass.
 Enterprise Mfg. Co., Philadelphia, Pa.
 Fairmount Machine Co., Philadelphia, Pa.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 R. W. Whitehurst & Co., Norfolk, Va.

PRESSES, Gun Cotton—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

PRESSES, Hay—

R. W. Whitehurst & Co., Norfolk, Va.

PRESSES, Hydraulic—

Bement, Miles & Co., Philadelphia, Pa.
 Lloyd Booth Co., Youngstown, O.
 Farrel Foundry & Mach. Co., Ansonia, Ct.
 John H. McGowan Co., Cincinnati, O.
 Morgan Construction Co., Worcester, Mass.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 R. D. Wood & Co., Philadelphia, Pa.

PRESSES, Hydraulic Forging—

Bement, Miles & Co., Philadelphia, Pa.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.

PRESSES, Hydraulic Wheel—

Bement, Miles & Co., Philadelphia, Pa.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Richard Dudgeon, 24 Columbia St., N. Y.
 Flier & Stowell Co., Milwaukee, Wis.
 Hill, Clarke & Co., Boston, Mass.
 Niles Tool Works Co., Hamilton, O.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

PRESSES, Lard—

Enterprise Mfg. Co., Philadelphia, Pa.
 Fairmount Machine Co., Philadelphia, Pa.
 Lansing Wheelbarrow Co., Lansing, Mich.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Silver Mfg. Co., Salem, O.

PRESSES, Letter—

Fairbanks Co., 311 Broadway, New York.

PRESSES, Paper, Carton Cover—

Adriance Machine Works, Brooklyn, N. Y.

PRESSES, Power—

Adriance Machine Works, Brooklyn, N. Y.
 Automatic Machine Co., Bridgeport, Ct.
 Beaudry & Co., Boston, Mass.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Blake & Johnson, Waterbury, Ct.
 E. W. Bliss Co., Brooklyn, N. Y.
 T. W. G. Cook, 4 Reade St., New York.
 Cross & Speirs Machine Co., Waterbury, Ct.
 Danielson Machine & Tool Co., Cleveland, O.
 Erdle & Schenck, Rochester, N. Y.
 Ferracute Machine Co., Bridgeton, N. J.
 Fox Machine Co., Grand Rapids, Mich.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Gould & Eberhardt, Newark, N. J.
 W. H. Hibbard, Brooklyn, N. Y.
 Chas. E. Leffer & Co., Brooklyn, N. Y.
 J. J. McCabe, 14 Dey St., New York.
 E. J. Manville Machine Co., Waterbury, Ct.
 Marshall & Hushart Machinery Co., Chicago, Ill.
 A. H. Merriman, Meriden, Ct.
 Mossberg & Granville Mfg. Co., Providence, R. I.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Niles Tool Works Co., Hamilton, O.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Richard Mfg. Co., Bloomsburg, Pa.
 Rudolph & Krummel, Chicago, Ill.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 Woolley Foundry & Machine Works, Anderson, Ind.
 S. M. York Co., Cleveland, O.

PRESSES, Printing—

Consolidated Railway Electric Lighting & Equipment Co., Derby, Ct.

PRESSES, Punching—

Avery Stamping Co., Cleveland, O.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 E. W. Bliss Co., Brooklyn, N. Y.
 T. W. G. Cook, 4 Reade St., New York.
 Cross & Speirs Machine Co., Waterbury, Ct.
 Danielson Machine & Tool Co., Cleveland, O.
 Ferracute Machine Co., Bridgeton, N. J.
 Fox Machine Co., Grand Rapids, Mich.
 Hagen & Reid, Troy, N. Y.
 W. H. Hibbard, Brooklyn, N. Y.
 Hilles & Jones Co., Wilmington, Del.
 A. H. Merriman, Meriden, Ct.
 Mossberg & Granville Mfg. Co., Providence, R. I.
 New Doty Mfg. Co., Janesville, Wis.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Niles Tool Works Co., Hamilton, O.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 Pratt & Whitney Co., Hartford, Ct.
 Rudolph & Krummel, Chicago, Ill.
 Waterbury Farrel Foundry & Mach. Co., Waterbury, Ct.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 Wiley & Russell Mfg. Co., Greenfield, Mass.

PRESSES, Roofing and Tile—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

PRESSES, Screw—

W. F. & John Barnes Co., Rockford, Ill.
 E. W. Bliss Co., Brooklyn, N. Y.
 T. W. G. Cook, 4 Reade St., New York.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Ferracute Machine Co., Bridgeton, N. J.
 Gould & Eberhardt, Newark, N. J.
 W. H. Hibbard, Brooklyn, N. Y.
 Mossberg & Granville Mfg. Co., Providence, R. I.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 Rudolph & Krummel, Chicago, Ill.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

PRESSES, Seal—

Geo. M. Ness, Jr., 61 Fulton St., New York.
 Schwerdtle & Siebert, Bridgeport, Ct.

PRESSES, Sewer Pipe—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

PRESSES, Stamping—

Adriance Machine Works, Brooklyn, N. Y.
 E. W. Bliss, Brooklyn, N. Y.
 Cleveland Stamping & Tool Co., Cleveland.
 T. W. G. Cook, 4 Reade St., New York.
 Danielson Machine & Tool Co., Cleveland, O.
 Ferracute Machine Co., Bridgeton, N. J.
 Fox Machine Co., Grand Rapids, Mich.
 W. H. Hibbard, Brooklyn, N. Y.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Philadelphia Machine Tool Co., Philadelphia, Pa.

PRESSES, Steel Plate Engraving—

Gould & Eberhardt, Newark, N. J.

PRESSES, Tincture—

Enterprise Mfg. Co., Philadelphia, Pa.

PRESSES, Tobacco—

L. S. Spencer's Sons, Guilford, Ct.

PRESSES, Trimming—

Adriance Machine Works, Brooklyn, N. Y.
 Bement, Miles & Co., Philadelphia, Pa.
 Billings & Spencer Co., Hartford, Ct.
 E. W. Bliss Co., Brooklyn, N. Y.
 T. W. G. Cook, 4 Reade St., New York.
 W. H. Hibbard, Brooklyn, N. Y.
 Hilles & Jones Co., Wilmington, Del.
 Merrill Bros., Brooklyn, N. Y.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Niles Tool Works Co., Hamilton, O.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 Pratt & Whitney Co., Hartford, Ct.
 Rudolph & Krummel, Chicago, Ill.

PRIMERS—

Peters Cartridge Co., Cincinnati, O.
 Union Metallic Cartridge Co., 313-315 Broadway, New York.
 Waterbury Brass Co., Waterbury, Ct.

PRINTERS' RUBBER BLANKETS—See Blankets, Printers' Rubber.**PRINTERS' RULE BRASS—See Brass, Rule, Printers'.****PRINTING MACHINERY—**

Howard Iron Works, Buffalo, N. Y.

PRODS, Cattle—

Iowa Farming Tool Co., Fort Madison, Ia.

PRODUCERS, Gas—

Duff Patents Co., Pittsburgh, Pa.
 Edward E. Erikson, Pittsburgh, Pa.
 Alex. Laughlin & Co., Pittsburgh, Pa.
 W. W. Lindsay & Co., Philadelphia, Pa.
 G. W. McClure & Son, Pittsburgh, Pa.
 Miller Bros. & Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 Wm. B. Pollock Co., Youngstown, O.
 Ritter-Conley Mfg. Co., Pittsburgh, Pa.
 S. R. Smythe Co., Pittsburgh, Pa.
 Wm. Swindell & Bro., Pittsburgh, Pa.
 R. D. Wood & Co., Philadelphia, Pa.

PROFILING MACHINES—

Garvin Machine Co., Spring & Varick Sts., New York.
 Pratt & Whitney Co., Hartford, Ct.

PROP BLOCK WASHERS—See Washers, Prop Block.**PROTECTORS, Package—**

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

PROTECTORS, Strap—

Covert's Saddlery Works, Farmer, N. Y.

PROTRACTORS—

Athol Machine Co., Athol, Mass.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 L. S. Starrett Co., Athol, Mass.
 J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

PROTRACTORS AND TRIANGLES—

Tower & Lyon, 95 Chambers St., New York.

PROVISION SAFES—See Safes, Provision.**PRUNERS—**

J. T. Henry Mfg. Co., Hamden, Ct.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

PRUNING SAWS, SHEARS—See Saws, Shears.**PUBLISHERS, Book—**

A. Mugford, Hartford, Ct.
 David Williams Co., 232 William St., N. Y.

PUG MILLS—

Thomas Carlin's Sons, Allegheny, Pa.
 Turner Vaughn & Taylor Co., Cuyahoga Falls, O.

PULLERS, Cork—

Arcade Mfg. Co., Freeport, Ill.
 Enterprise Mfg. Co., Philadelphia, Pa.
 Erie Specialty Co., Erie, Pa.

PULLERS, Nail—

Atwater Mfg. Co., Southington, Ct.
 Belden Machine Co., New Haven, Ct.
 Bridgeport Mfg. Co., Bridgeport, Ct.
 Chantrell Tool Co., Reading, Pa.
 Goodell-Pratt Co., Greenfield, Mass.
 Hagen & Reid, Troy, N. Y.
 Metropolitan Daylight Lamp Co., Chicago, Ill.
 Millers Falls Co., 28 Warren St., New York.
 National Specialty Mfg. Co., Philadelphia.
 Scranton & Co., New Haven, Ct.
 Tower & Lyon, 95 Chambers St., New York.

PULLERS, Staple—

Metropolitan Daylight Lamp Co., Chicago, Ill.
 Utica Drop Forge & Tool Co., Utica, N. Y.

PULLERS, Tack—

Bridgeport Mfg. Co., Bridgeport, Ct.
 Hagen & Reid, Troy, N. Y.
 Scranton & Co., New Haven, Ct.
 Utica Drop Forge & Tool Co., Utica, N. Y.
 Wrightsville Hardware Co., Wrightsville, Pa.

PULLERS, Valve, Bicycle—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

PULLEY BUSHINGS, TURNING LATHES, &c.—See Bushings, Lathes, &c.**PULLEY HOOKS, FLOOR—See Hooks, Floor Pulley.****PULLEYS, Ceiling—**

Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

PULLEYS, Clothes Line—

Logan & Strobbridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.

PULLEYS, Dumb Waiter—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

PULLEYS, Electric Light—

Reading Hardware Co., Reading, Pa.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

PULLEYS, Friction Clutch—

E. W. Bliss Co., Brooklyn, N. Y.
Brown Hoisting & Conveying Mch. Co., Cleveland, O.
Geo. V. Cresson Co., Philadelphia, Pa.
Eastern Machinery Co., New Haven, Ct.
Fairmount Machine Co., Philadelphia, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Garvin Machine Co., Spring & Varick Sts., New York.
Hess, Snyder & Co., Massillon, O.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.
New Haven Mfg. Co., New Haven, Ct.
R. Poole & Son Co., Baltimore, Md.
Pratt & Whitney Co., Hartford, Ct.
T. B. Woods' Sons, Chambersburg, Pa.

PULLEYS, Friction Cone—

G. F. Evans, Boston, Mass.

PULLEYS, Grip—

California Wire Works, San Francisco, Cal.

PULLEYS, Hay Fork—

Cleveland Block Co., Cleveland, O.
Goshen Mfg. Co., Goshen, Ind.
Janesville Hay Tool Co., Janesville, Wis.
John C. Kupferle, St. Louis, Mo.
Lawrence Bros., Sterling Ill.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Louden Machinery Co., Fairfield, Ia.
F. E. Myers & Bro., Ashland, O.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Red Jacket Mfg. Co., Davenport, Ia.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
Wrightsville Hardware Co., Wrightsville, Pa.

PULLEYS, Hot House—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.

PULLEYS, Pressed Steel—

American Pulley Co., Philadelphia, Pa.

PULLEYS, Sash—

Caldwell Mfg. Co., Rochester, N. Y.
Coleman Hardware Co., Chicago, Ill.
Doebler Mfg. Co., Middletown, Ct.
Fox Machine Co., Grand Rapids, Mich.
Grand Rapids Hardware Co., Grand Rapids, Mich.
John C. Kupferle, St. Louis, Mo.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Norwalk Lock Co., South Norwalk, Ct.
Palmer Hardware Mfg. Co., Troy, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Stover Mfg. Co., Freeport, Ill.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wrightsville Hardware Co., Wrightsville, Pa.

PULLEYS, Screw—

Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.

PULLEYS, Self Adjustable Shade—

I. E. Palmer, Middletown, Ct.

PULLEYS, Shaft—

E. P. Allis Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Aultman Co., Canton, O.
Baker Bros., Toledo, O.
Bates Machine Co., Joliet, Ill.
Boston Gear Works, Boston, Mass.
Braddock Machine & Mfg. Co., Braddock, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., New Haven, Ct.
Fairmount Machine Co., Philadelphia, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Hess, Snyder & Co., Massillon, O.
Heyl & Patterson, Pittsburgh, Pa.
Howard Iron Works, Buffalo, N. Y.
F. W. Iredell, 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.
Jones & Laughlin, Ltd., Pittsburgh, Pa.
Lane & Bodley Co., Cincinnati, O.
James Leffel & Co., Springfield, O.
Machinists' Supply Co., Rochester, N. Y.
Niles Tool Works Co., Hamilton, O.
F. R. Patch Mfg. Co., Rutland, Vt.
R. Poole & Son Co., Baltimore, Md.
Saginaw Mfg. Co., Saginaw, Mich.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Variety Machine Co., Warsaw, N. Y.
T. F. Welch Mfg. Co., Boston, Mass.
T. B. Woods' Sons, Chambersburg, Pa.

PULLEYS, Side—

Doebler Mfg. Co., Middletown, Ct.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

PULLEYS, Tackle or Awning—

Doebler Mfg. Co., Middletown, Ct.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.

PULLEYS, Upright—

Doebler Mfg. Co., Middletown, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.

PULLEYS, Wood Split—

Baker Bros., Toledo, O.
Buhl Malleable Co., Detroit, Mich.
Dodge Mfg. Co., Mishawaka, Ind.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Saginaw Mfg. Co., Saginaw, Mich.

PULL PLATES—See Plates, Pull, Push and Kick.**PULLS, Bell—**

Norwalk Lock Co., South Norwalk, Ct.
W. R. Ostrander & Co., 22 Dey St., N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.

PULLS, Door—

Arcade Mfg. Co., Freeport, Ill.
Chicago Spring Butt Co., Chicago, Ill.
Ney Mfg. Co., Canton, O.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
W. & J. Tiebout, 118 Chambers St., N. Y.
U. S. Steel Lock Co., Clinton, Ia.
Van Wagoner & Williams Hardware Co., Cleveland, O.

PULLS, Drawer—

Arcade Mfg. Co., Freeport, Ill.
Jos. Bardsley, 147-151 Baxter St., N. Y.
Doebler Mfg. Co., Middletown, Ct.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stanley Works, New Britain, Ct.
Stover Mfg. Co., Freeport, Ill.
Taylor & Boggis Foundry Co., Cleveland.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

PULLS, Window—

Norwalk Lock Co., South Norwalk, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

PULVERIZERS, Ore and Clay—

A. Garrison Foundry Co., Pittsburgh, Pa.

PUMP CHAIN CYLINDERS, RODS—See Chain Cylinders, Rods.**PUMP FITTERS' SUPPLIES—**

Humphreys Mfg. Co., Mansfield, O.

PUMP FIXTURES, Chain—

John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Union Mfg. Co., New Britain, Ct.

PUMPING OIL WELLS, Machinery for—

A. D. Cook, Lawrenceburgh, Ind.
Merrell Mfg. Co., Toledo, O.

PUMP LEATHERS—See Leathers, Pump.**PUMP PLATFORMS, IRON—See Platforms, Iron Pump.****PUMP PRESSURE REGULATORS—See Regulators, Pump Pressure.****PUMP ROD COUPLINGS—See Couplings, Pump Rod.****PUMPS, Air Lift—**

Clayton Air Compressor Works, 28 Cortlandt St., New York.
Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
Rand Drill Co., 100 Broadway, N. Y.

PUMPS, Artesian Well, and Cylinders—

E. W. Bliss Co., Brooklyn, N. Y.
Deming Co., Salem, O.

PUMPS, Bicycle and Automobile—

Braunsdorf-Mueller Co., Elizabeth, N. J.
Bridgeport Brass Co., Bridgeport, Ct.
Bridgeport Gun Implement Co., 313 Broadway, New York.
Gleason-Peters Air Pump Co., Houston and Mercer Sts., New York.
Rome Mfg. Co., Rome, N. Y.
D. B. Smith & Co., Utica, N. Y.

PUMPS, Boiler Feed—

E. P. Allis, Milwaukee, Wis.
Barnes Mfg. Co., Mansfield, O.
Bicknell Hardware Co., Janesville, Wis.
Deming Co., Salem, O.
Benj. F. Kelley & Son, 91 Liberty St., N. Y.
John H. McGowan Co., Cincinnati, O.
Mason Regulator Co., Boston, Mass.
F. E. Myers & Bro., Ashland, O.

PUMPS, Boiler Test—

Bridgeport Brass Co., Bridgeport, Ct.
Scovill Mfg. Co., Waterbury, Ct.

PUMPS, Brass—

Bridgeport Brass Co., Bridgeport, Ct.
Scovill Mfg. Co., Waterbury, Ct.

PUMPS, Centrifugal—

Edw. P. Allis Co., Milwaukee, Wis.
Barnes Mfg. Co., Mansfield, O.
Deming Co., Salem, O.
Humphreys Mfg. Co., Mansfield, O.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Union Mfg. Co., New Britain, Ct.

PUMPS, Chain—

Union Mfg. Co., New Britain, Ct.

PUMPS, Cistern, Pitcher Spout, &c.—

Athol Pump Co., Athol, Mass.
 Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 Hess, Snyder & Co., Massillon, O.
 F. E. Myers & Bro., Ashland, O.
 Sandwich Enterprise Co., Sandwich, Ill.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 S. Wilder & Co., Holliston, Mass.

PUMPS, Compression and Vacuum—

E. W. Bliss Co., Brooklyn, N. Y.
 Deming Co., Salem, O.
 Gleason-Peters Air Pump Co., Houston and Mercer Sts., New York.
 John H. McGowan Co., Cincinnati, O.
 New York Air Compressor Co., 95 Liberty St., New York.

PUMPS, Copper—

Athol Pump Co., Athol, Mass.
 S. Wilder & Co., Holliston, Mass.

PUMPS, Diaphragm—

Barnes Mfg. Co., Mansfield, O.
 Boston & Lockport Block Co., Boston.
 Edson Mfg. Co., Boston, Mass.
 Union Hardware Co., Torrington, Ct.

PUMPS, Electric—

Deming Co., Salem, O.
 General Electric Co., Schenectady, N. Y.
 Jeffrey Mfg. Co., Columbus, O.

PUMPS, Elevator—

E. W. Bliss Co., Brooklyn, N. Y.
 John H. McGowan Co., Cincinnati, O.

PUMPS, Elevator Bucket and Purifying—

Buhl Malleable Co., Detroit, Mich.
 St. Joseph Pump & Mfg. Co., St. Joseph, Mo.

PUMPS, Fire—

E. W. Bliss Co., Brooklyn, N. Y.

PUMPS, Force—

Athol Pump Co., Athol, Mass.
 Barnes Mfg. Co., Mansfield, O.
 E. W. Bliss Co., Brooklyn, N. Y.
 Deming Co., Salem, O.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 Hess, Snyder & Co., Massillon, O.
 McNab & Harlin Mfg. Co., 56 John St., New York.
 F. E. Myers & Bro., Ashland, O.
 Red Jacket Mfg. Co., Davenport, Ia.
 Sandwich Enterprise Co., Sandwich, Ill.
 Union Mfg. Co., New Britain, Ct.
 S. Wilder & Co., Holliston, Mass.

PUMPS, Grouting, Sewerage, Quarry—

Deming Co., Salem, O.
 Edson Mfg. Co., Boston, Mass.

PUMPS, Ham Preserving—

Deming Co., Salem, O.
 Silver Mfg. Co., Salem, O.

PUMPS, Horse-power—

Deming Co., Salem, O.
 F. E. Myers & Bro., Ashland, O.

PUMPS, Irrigation—

Edw. P. Allis Co., Milwaukee, Wis.
 Barnes Mfg. Co., Mansfield, O.
 E. W. Bliss Co., Brooklyn, N. Y.
 Deming Co., Salem, O.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 John H. McGowan Co., Cincinnati, O.
 F. E. Myers & Bro., Ashland, O.
 Red Jacket Mfg. Co., Davenport, Ia.
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.

PUMPS, Jacket—

Barnes Mfg. Co., Mansfield, O.

PUMPS, Lift—

Bicknell Hardware Co., Janesville, Wis.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 Aug. Metz, 128-138 Mott St., New York.
 F. E. Myers & Bro., Ashland, O.
 Red Jacket Mfg. Co., Davenport, Ia.

PUMPS, Mine (Cylinders and Heads)—

Barnes Mfg. Co., Mansfield, O.
 E. W. Bliss Co., Brooklyn, N. Y.
 Deming Co., Salem, O.
 Flint & Walling Mfg. Co., Kendallville, Ind.

PUMPS, Oil—

Brown & Sharpe Mfg. Co., Providence, R. I.
 Deming Co., Salem, O.

PUMPS, Plumbers' and Gas Fitters—

Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Gleason-Peters Air Pump Co., Houston and Mercer Sts., New York.

PUMPS, Power—

Edw. P. Allis Co., Milwaukee, Wis.
 Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 John H. McGowan Co., Cincinnati, O.
 F. E. Myers & Bro., Ashland, O.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.

PUMPS, Rotary—

Barnes Mfg. Co., Mansfield, O.
 Southwark Foundry & Machine Co., Philadelphia, Pa.
 Wilbraham-Baker Blower Co., Philadelphia, Pa.

PUMPS, Self Measuring—

Enterprise Mfg. Co., Philadelphia, Pa.
 Anthony Wayne Mfg. Co., Fort Wayne, Ind.

PUMPS, Sewerage—

E. W. Bliss Co., Brooklyn, N. Y.

PUMPS, Ship and Deck—

Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Edson Mfg. Co., Boston, Mass.

PUMPS, Siphon—

Barnes Mfg. Co., Mansfield, O.
 Humphries Mfg. Co., Mansfield, O.
 F. E. Myers & Bro., Ashland, O.

PUMPS, Spraying—

Aspinwall Mfg. Co., Jackson, Mich.
 Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 Grand Rapids Hardware Co., Grand Rapids, Mich.
 Hess, Snyder & Co., Massillon, O.
 F. E. Kohler & Co., Canton, O.
 F. E. Myers & Bro., Ashland, O.
 Red Jacket Mfg. Co., Davenport, Ia.
 Rome Mfg. Co., Rome, N. Y.
 Sandwich Enterprise Co., Sandwich, Ill.
 D. B. Smith & Co., Utica, N. Y.

PUMPS, Steam—

E. W. Bliss Co., Brooklyn, N. Y.
 Thomas P. Conard, Philadelphia, Pa.
 Consolidated Railway Electric Lighting & Equipment Co., Derby, Ct.
 A. D. Cook, Lawrenceburg, Ind.
 Filer & Stowell Co., Milwaukee, Wis.
 Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.
 Lovegrove & Co., Philadelphia, Pa.
 John H. McGowan Co., Cincinnati, O.
 F. McSwegan & Sons, 120 Liberty St., New York.
 Mason Regulator Co., Boston, Mass.
 Frank Toomey, Philadelphia, Pa.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 W. W. Whitehead, Davenport, Iowa.
 Henry R. Worthington, 120 Liberty St., New York.

PUMPS, Steel Works—

John H. McGowan Co., Cincinnati, O.

PUMPS, Tank—

E. W. Bliss Co., Brooklyn, N. Y.
 Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Humphries Mfg. Co., Mansfield, O.
 John H. McGowan Co., Cincinnati, O.
 F. E. Myers & Bro., Ashland, O.
 Red Jacket Mfg. Co., Davenport, Ia.

PUMPS, Trench—

Red Jacket Mfg. Co., Davenport, Ia.

PUMPS, Vault and Cesspool—

Edson Mfg. Co., Boston, Mass.

PUMPS, Water Works—

E. P. Allis Co., Milwaukee, Wis.
 E. W. Bliss Co., Brooklyn, N. Y.
 Deming Co., Salem, O.
 John H. McGowan Co., Cincinnati, O.
 Wm. Tod & Co., Youngstown, O.

PUMPS, Windmill—

Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Flint & Walling Mfg. Co., Kendallville, Ind.
 Humphries Mfg. Co., Mansfield, O.
 F. E. Myers & Bro., Ashland, O.

PUNCHES, Belt—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
 Doebler Mfg. Co., Middletown, Ct.

PUNCHES, Carvers—

T. F. Welch Mfg. Co., Boston, Mass.

PUNCHES, Cattle—

Fred. J. Meyers Mfg. Co., Hamilton, O.

PUNCHES, Check—

Hoggson & Pettis Mfg. Co., New Haven, Ct.

PUNCHES, Conductor, Ticket, &c.—

American Railway Supply Co., 24 Park Place, New York.
 Bridgeport Mfg. Co., Bridgeport, Ct.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Smith & Egge Mfg. Co., Bridgeport, Ct.
 R. Woodman Mfg. & Supply Co., Boston.

PUNCHES, Drive—

Bemis & Call Hardware & Tool Co., Springfield, Mass.
 Braunsdorf-Mueller Co., Elizabeth, N. J.
 Charles Buck, Milbury, Mass.
 Buck Bros., Milbury, Mass.
 H. H. Mayhew Co., Shelburne Falls, Mass.
 Nicol & Co., Chicago, Ill.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Springfield Machine Screw Co., Springfield, Mass.
 L. S. Starrett Co., Athol, Mass.
 J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
 Transue & Williams Co., Alliance, O.
 Tuck Mfg. Co., Brockton, Mass.
 T. F. Welch Mfg. Co., Boston, Mass.

PUNCHES, Embossing—

R. Woodman Mfg. & Supply Co., Boston.

PUNCHES, Eyelet and Fastener—

Wm. Schollhorn Co., New Haven, Ct.

PUNCHES, Hand and Power—

American Tool Works Co., Cincinnati, O.
 Bement, Miles & Co., Philadelphia, Pa.
 Bertsch & Co., Cambridge City, Ind.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 Bicknell Hardware Co., Janesville, Wis.
 Bignall & Keeler Mfg. Co., Edwardsville, Ind.
 E. W. Bliss Co., Brooklyn, N. Y.
 Lloyd Booth Co., Youngstown, O.
 Buffalo Forge Co., Buffalo, N. Y.
 Charles G. Eckstein & Co., 249 Center St., New York.
 Erdle & Schenck, Rochester, N. Y.
 Ferracute Machine Co., Bridgeton, N. J.
 Fox Machine Co., Grand Rapids, Mich.
 Frank-Kneeland Machine Co., Pittsburgh.
 Fulton Iron & Engine Works, Detroit, Mich.
 Hagen & Reid, Troy, N. Y.
 Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
 Hill, Clarke & Co., Boston, Mass.
 Hillis & Jones Co., Wilmington, Del.
 B. E. Kidder, Worcester, Mass.
 Long & Allstatter Co., Hamilton, O.
 John Loyd, 558 Water St., New York.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 J. J. McCabe, 14 Dey St., New York.
 Jos. F. McCoy Co., 26 Warren St., N. Y.
 Frank Mossberg Co., Attleboro, Mass.
 National Machinery Co., Tiffin, O.
 New Doty Mfg. Co., Janesville, O.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Niles Tool Works Co., Hamilton, O.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
 Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
 Pratt & Whitney Co., Hartford, Ct.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Royersford Foundry & Machine Co., Royersford, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Ct.
 Walls & Roos Punch & Shear Co., Cincinnati, O.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 Whitcomb Mfg. Co., Worcester, Mass.
 Wickes Bros., Saginaw, Mich.
 Williams, White & Co., Moline, Ill.
 Wilson & Smith, Worcester, Mass.
 R. D. Wood & Co., Philadelphia, Pa.
 W. C. Young Mfg. Co., Worcester, Mass.

PUNCHES, Hand and Tube Hole—

Hillis & Jones Co., Wilmington, Del.
 Long & Allstatter Co., Hamilton, O.
 New Doty Mfg. Co., Janesville, Wis.
 Wickes Bros., Saginaw, Mich.

PUNCHES, Hydraulic—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Richard Dudgeon, 24 Columbia St., N. Y.
Frank-Kneeland Machine Co., Pittsburgh.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.
R. D. Wood & Co., Philadelphia, Pa.

PUNCHES, Multiple—

Hilles & Jones Co., Wilmington, Del.
Long & Allstatter Co., Hamilton, O.
Manning, Maxwell & Moore, 85 Liberty St., New York.
New Doty Mfg. Co., Janesville, Wis.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Wals & Roos Punch & Shear Co., Cincinnati, O.
Williams, White & Co., Moline, Ill.

PUNCHES, Paper—

Globe-Wernicke Co., Cincinnati, O.
Sam'l C. Tatum Co., Cincinnati, O.

PUNCHES, Spiral Shear—

Pratt & Whitney Co., Hartford, Ct.

PUNCHES, Spring—

Fred. J. Meyers Mfg. Co., Hamilton, O.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Springfield Machine Screw Co., Springfield, Mass.
Star Heel Plate Co., Newark, N. J.

PUNCHING IRONS, PRESSES—See Irons, Presses.**PUNCHING MACHINES, I-Beam—**

Long & Allstatter Co., Hamilton, O.
New Doty Mfg. Co., Janesville, Wis.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.

PUNCHING MACHINES, Paper—

Sam'l C. Tatum Co., Cincinnati, O.

PUNCHING METAL—

New England Specialty Co., N. Easton, Mass.
Wilson & Smith, Worcester, Mass.

PURIFIERS, Feed Water—

Bates Machine Co., Joliet, Ill.
Dodge Mfg. Co., Mishawaka, Ind.
Harrisburg Pipe Bending Co., Harrisburg, Pa.
Harrison Safety Boiler Works, Philadelphia, Pa.
National Pipe Bending Co., New Haven, Ct.
Frank L. Patterson, 139 Liberty St., N. Y.
Warren Webster & Co., Camden, N. J.
Wickes Bros., Saginaw, Mich.

PURIFYING PUMPS—See Pumps, Elevator Bucket and Purifying.**PUSH BUTTONS, CARTS, PLATES—See Buttons, Carts, Plates.****PUSHERS, Car—**

Boston & Lockport Block Co., Boston.
Theodore Thomas, 11 Broadway, New York.
R. Woodman Mfg. & Supply Co., Boston.

PUSHES, Electric Bell—

Norwalk Lock Co., South Norwalk Ct.
Reading Hardware Co., Reading, Pa.

PUTTY, Iron—

Morgan & Wright, Chicago, Ill.

PUTTY, Stove—

Cleveland Stone Co., Cleveland, O.

PYROMETERS—

Ashton Valve Co., Boston, Mass.
Edward Brown, Philadelphia, Pa.
Elmer & Amend, 205 3d Ave., New York.
Uehling, Steinbart & Co., Newark, N. J.

PYROMETERS, Recording—

Bristol Co., Waterbury, Ct.
Edward Brown, Philadelphia, Pa.
Elmer & Amend, 205 3d Ave., New York.
Uehling, Steinbart & Co., Newark, N. J.

QUADRANTS, Brass Skylight—

W. & J. Tiebout, 118 Chambers St., N. Y.

QUARRY BARS—

Ingersoll-Sergeant Drill Co., Havemeyer Building, New York.

QUARRY PUMPS—See Pumps, Grouting and Quarry.**QUARTERING MACHINES—**

Bement, Miles & Co., Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

QUOITS—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Sam'l C. Tatum Co., Cincinnati, O.
A. C. Williams, Ravenna, O.

RABBIT AND BUTT GAUGES—See Gauges, Butt and Rabbit.**RACK CUTTERS, AUTOMATIC—See Cutters, Automatic Rack.****RACKS AND RINGS, Towel—**

Crescent Brass & Iron Co., Detroit, Mich.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Troy Nickel Works, Albany, N. Y.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

RACKS, Broom—

Nicol & Co., Chicago, Ill.

RACKS, Card, Book and Paper—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Sam'l C. Tatum Co., Cincinnati, O.

RACKS, Clothes—

J. R. Clark Co., Minneapolis, Minn.
Crescent Brass & Iron Co., Detroit, Mich.
Hill Dryer Co., Worcester, Mass.
Nicol & Co., Chicago, Ill.

RACKS, Copying Press Display—

Sam'l C. Tatum Co., Cincinnati, O.

RACKS, Drill and Tool—

Geo. Gorton Machine Co., Racine, Wis.

RACKS, Fruit Steaming—

Sidney Shepard & Co., Buffalo, N. Y.

RACKS, Hat and Coat—

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

RACKS, Pew, Book—

Logan & Strobridge Iron Co., New Brighton, Pa.
Ludlow & Saylor Wire Co., St. Louis, Mo.

RACKS, Pie—

Wire Goods Co., Worcester, Mass.

RACKS, Steel Goods—

Iowa Farming Tool Co., Fort Madison, Ia.

RACKS, Wire Netting—

Matthew Burton, Batavia, Ill.

RADIATOR SCREENS—See Screens, Radiator.**RADIATORS, Gas and Oil—**

Wm. M. Crane Co., 1131 Broadway, N. Y.
Schneider & Trenkamp Co., Cleveland, O.

RADIATORS, Steam and Hot Water—

Jarecki Mfg. Co., Erie, Pa.
S. M. York Co., Cleveland, O.

RAFTER BRACKETS, GRAPPLES—See Brackets, Grapples.**RAIL BENDERS, BONDS, DRILLS—See Benders, Bonds, Drills.****RAIL, Door—**

Bridgeport Brass Co., Bridgeport, Ct.
Chicago Spring Butt Co., Chicago, Ill.
Chisholm & Moore Mfg. Co., Cleveland, O.
Coleman Hardware Co., Chicago, Ill.
Janesville Hay Tool Co., Janesville, Wis.
John C. Kupferle, St. Louis, Mo.
Lane Bros. Co., Poughkeepsie, N. Y.
Lawrence Bros., Sterling, Ill.
McKinney Mfg. Co., Allegheny, Pa.
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

Pleuger & Henger Mfg. Co., St. Louis, Mo.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Randolph-Clowes Co., Waterbury, Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Scovill Mfg. Co., Waterbury, Ct.
Stanley Works, New Britain, Ct.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
Wilcox Mfg. Co., Aurora, Ind.

RAIL ENDING MACHINES—

Lucas & Gilem, Philadelphia, Pa.

RAILING AND BRACKETS, Office, Counter, &c.—

E. T. Barnum, Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Edward Darby & Sons, Philadelphia, Pa.
Dow Wire Works Co., Louisville, Ky.
Ellis & Halfenbarger, Indianapolis, Ind.
Estey Wire Works Co., 65 Fulton St., N. Y.
Howard & Morse, 45 Fulton St., New York.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.
A. & T. McKenna, Pittsburgh, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Murdoch Parlor Grate Co., Boston, Mass.
National Iron & Wire Co., Cleveland, O.
Scheeler's Sons, Buffalo, N. Y.
Stewart Iron Works, Cincinnati, O.
W. S. Tyler Co., Cleveland, O.
Up-to-Date Mfg. Co., Terre Haute, Ind.
Van Dorn Iron Works Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

RAILINGS, Bridge—

Belmont Iron Works, Philadelphia, Pa.

RAILROAD CARS, FORGINGS, &c.—See Cars, Forgings, &c.**RAILROAD EQUIPMENT—**

Atlas Bolt & Screw Co., Cleveland, O.
Justice Cox, Jr. & Co., Ltd., Philadelphia, Pa.
Poulterer & Co., Philadelphia, Pa.
W. H. Thomson & Co., Philadelphia, Pa.

RAILROAD EQUIPMENT, Electric—

General Electric Co., Schenectady, N. Y.

RAILROADS—

Cleveland, Cincinnati, Chicago & St. Louis Railroad.

RAILROADS, CABLE—See Conveying Machinery.**RAILROAD SHOP WOOD WORKING MACHINERY—See Cars, Shop, Wood Working Machinery.****RAILROAD, Street, Special Work—**

Lorain Steel Co., Lorain, O.

RAILROAD UNLOADERS—See Unloaders, Railroad.**RAILS AND HANGERS, Suspended—**

Ney Mfg. Co., Canton, O.
Trenton Iron Co., Trenton, N. J.

RAILS, Dash—

Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

RAILS, Girder—

Lorain Steel Co., Lorain, O.

RAILS, Light—

American Steel Hoop Co., Pittsburgh, Pa.
Atlas Bolt & Screw Co., Cleveland, O.
Bethlehem Steel Co., South Bethlehem, Pa.
Donaldson & Newton, Philadelphia, Pa.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

RAILS, OLD—See Material, Old.**RAILS, Relaying—**

Donaldson & Newton, Philadelphia, Pa.
W. H. Perry & Co., Providence, R. I.
M. Samuel & Sons, Brooklyn, N. Y.

RAILS, Steel—

Atlas Bolt & Screw Co., Cleveland, O.
 Thomas P. Conard, Pittsburgh, Pa.
 Justice Cox, Jr. & Co., Ltd., Philadelphia, Pa.
 Donaldson & Newton, Philadelphia, Pa.
 J. H. Hillman & Son, Pittsburgh, Pa.
 J. W. Hoffman & Co., Philadelphia, Pa.
 C. B. Houston & Co., Philadelphia, Pa.
 Illinois Steel Co., Chicago, Ill.
 Henry Levis & Co., Philadelphia, Pa.
 Lorain Steel Co., Lorain, O.
 National Steel Co., Battery Park Building, New York.
 John B. Newkirk & Co., Philadelphia, Pa.
 Nicolls, Wheeler & Co., Philadelphia, Pa.
 Pierson & Co., 29 Broadway, New York.

RAISIN SEEDERS—See Seeders, Raisin.**RAKE BRACKETS, TEETH—See Brackets, Teeth.****RAKE MACHINERY—See Fork, Rake and Hoe Machinery.****RAKES, Asphalt—**

Withington & Cooley Mfg. Co., Jackson, Mich.

RAKES, Ballast and Coal—

Withington & Cooley Mfg. Co., Jackson, Mich.

RAKES, Garden—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
 Ely Hoe & Fork Co., St. Johnsbury, Vt.
 Iowa Farming Tool Co., Fort Madison, Ia.
 Jenkins Iron & Tool Co., Howard, Pa.
 F. E. Kohler & Co., Canton, O.
 Terre Haute Shovel & Tool Co., Terre Haute, Ind.
 Wheeling Hinge Co., Wheeling, W. Va.

RAKES, Hay, Horse—

Famous Mfg. Co., Chicago, Ill.
 Long & Allstatter Co., Hamilton, O.

RAKES, Lawn—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
 Iowa Farming Tool Co., Fort Madison, Ia.
 F. E. Kohler & Co., Canton, O.
 Ney Mfg. Co., Canton, O.
 Withington & Cooley Mfg. Co., Jackson, Mich.

RAMMERS, Foundry—

Brown & Sharpe Mfg. Co., Providence, R. I.
 J. W. Paxson Co., Philadelphia, Pa.
 Philadelphia Pneumatic Tool Co., Philadelphia, Pa.

RAMS, Hydraulic—

Barnes Mfg. Co., Mansfield, O.
 Deming Co., Salem, O.
 Humphreys Mfg. Co., Mansfield, O.
 Morgan Construction Co., Worcester, Mass.
 F. E. Myers & Bro., Ashland, O.
 Union Mfg. Co., New Britain, Ct.
 R. D. Wood & Co., Philadelphia, Pa.

RANGES—See Stoves and Ranges.**RANGES, Combination Coal and Gas—**

Schneider & Trenkamp Co., Cleveland, O.

RANGES, Steel—

V. Clad & Sons, Philadelphia, Pa.
 Hess, Snyder & Co., Massillon, O.

RANGES, Steel, Coal and Wood—

Schneider & Trenkamp Co., Cleveland, O.

RASPS AND FILES—See Files and Rasps.**RASPS, Horse Tooth—**

Heller Bros. Co., Newark, N. J.
 Nicholson File Co., Providence, R. I.

RATCHET DIE STOCKS—See Die Stocks, Ratchet.**RATCHET DRILLS, PAWLS—See Drills, Pawls.****RATCHETS, Brass—**

Boston Gear Works, Boston, Mass.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 W. & J. Tiebout, 118 Chambers St., N. Y.
 T. F. Welch Mfg. Co., Boston, Mass.

RATCHET SCREW DRIVERS—See Drivers, Screw, Ratchet.**RATTLERS, Foundry—**

Northern Engineering Works, Detroit, Mich.

RAT TRAPS—See Traps.**RAWHIDE BELTING, BELT LACING—See Belting, Belt Lacing.****RAWHIDE HAMMERS, MALLET—See Hammers, Mallets.****RAZOR HONES—See Hones, Razor.****RAZOR PASTE, STROPS—See Paste, Stropps.****RAZORS—**

Charles Buck, Millbury, Mass.
 Buck Bros., Millbury, Mass.
 Cattaraugus Cutlery Co., Little Valley, N. Y.
 Fox Cutlery Co., Dubuque, Iowa.
 Swedish Razor Co., Worcester, Mass.
 Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

REAMER GRINDERS, HOLDERS, WRENCHES—See Grinders, Holders, Wrenches.**REAMERS—**

Buck Bros., Millbury, Mass.
 Charles Buck, Millbury, Mass.
 Butterfield & Co., Derby Line, Vt.
 S. W. Card Mfg. Co., Mansfield, O.
 Cleveland Twist Drill Co., Cleveland, O.
 J. M. King & Co., Waterford, N. Y.
 H. H. Mayhew Co., Shelburne Falls, Mass.
 Morse Twist Drill & Machine Co., New Bedford, Mass.
 New Process Twist Drill Co., Taunton, Mass.
 Norton Mfg. Co., Chester, Ct.
 Pratt & Whitney Co., Hartford, Ct.
 John M. Rogers Boat, Gauge & Drill Works, Gloucester City, N. J.
 Standard Tool Co., Cleveland, O.
 J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
 Stow Flexible Shaft Co., Philadelphia, Pa.
 Tuck Mfg. Co., Brockton, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.

REAMERS, PIPE—See Taps and Reamers, Pipe.**REAMING MACHINES—See Tapping and Reaming Machines.****REAPERS AND MOWERS—See Mowers and Reapers.****RECEIVERS, Air—**

Clayton Air Compressor Works, 28 Cortlandt St., New York.
 New York Air Compressor Co., 95 Liberty St., New York.
 Pedrick & Ayer Co., Philadelphia, Pa.
 Wm. B. Pollock Co., Youngstown, O.

RECEIVERS, Ash—

Taplin Mfg. Co., Forestville, Ct.

RECORDERS, Cash Autograph—

Hough Cash Recorder Co., Indian Orchard, Mass.

RECORDERS, STEAM, SPEED—See Indicators, Steam, Speed.**RECORDERS, Time—**

Chicago Time Register Co., Chicago, Ill.
 Heywood Bros. & Wakefield Co., Gardner, Mass.
 C. Nanz & Co., 127 Duane St., New York.

RECORDING INSTRUMENTS, Temperature—

Bristol Co., Waterbury, Ct.

REDUCERS, Conductor—

Garry Iron & Steel Roofing Co., Cleveland, O.

REDUCERS, HOSE—See Hose Attachments.**REDUCING MACHINES, Rotary—**

Mossberg & Granville Mfg. Co., Providence, R. I.

REDUCING RINGS, VALVES—See Rings, Valves.**REELING MACHINES—**

Fairmount Machine Co., Philadelphia, Pa.

REELS, Chalk Line—

R. Bliss Mfg. Co., Pawtucket, R. I.
 Stanley Rule & Level Co., New Britain, Ct.
 Union Hardware Co., Torrington, Ct.

REELS, Clothes Line—

Adams Co., Dubuque, Ia.
 John C. Kupferle, St. Louis, Mo.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 John Sommer's Son, Newark, N. J.

REELS, Fishing—

Andrew B. Hendryx Co., New Haven, Ct.
 John Sommer's Son, Newark, N. J.

REELS, Hose—

Caldwell Mfg. Co., Rochester, N. Y.
 Hollands Mfg. Co., Erie, Pa.
 R. W. Whitehurst & Co., Norfolk, Va.

REELS, Wire—

Automatic Machine Co., Bridgeport, Ct.
 Blake & Johnson, Waterbury, Ct.
 Mason Regulator Co., Boston, Mass.
 F. B. Shuster Co., New Haven, Ct.
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

REELS, Wire Rod—

Morgan Construction Co., Worcester, Mass.

REFLECTORS, Enameled—

Baltimore Enamel Co., Baltimore, Md.

REFLECTORS, Lamp—

Plume & Atwood Mfg. Co., Waterbury, Ct.

REFLECTORS, Locomotive—

Waterbury Brass Co., Waterbury, Ct.

REFRIGERATOR CATCHES, &c.—See Catches, &c.**REFRIGERATORS AND ICE CHESTS—**

V. Clad & Sons, Philadelphia, Pa.
 Maine Mfg. Co., Nashua, N. H.
 Wilke Mfg. Co., Anderson, Ind.

REGISTERS AND CEILING PLATES, Stove Pipe—

Adams Co., Dubuque, Ia.
 Arcade Mfg. Co., Freeport, Ill.
 S. Cheney & Sons, Manlius, N. Y.
 Stover Mfg. Co., Freeport, Ill.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

REGISTERS AND VENTILATORS—

Merchant & Co., Philadelphia, Pa.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

REGISTERS, Cash—

Whiting Mfg. Co., Northboro, Mass.

REGULATORS, Damper—

Jenkins Bros., 71 John St., New York.
 Mason Regulator Co., Boston, Mass.
 McNab & Harlin Mfg. Co., 56 John St., New York.

REGULATORS, Feed Water—

Crosby Steam Gate & Valve Co., Boston.
 Frank L. Patterson, 139 Liberty St., N. Y.

REGULATORS, Pump Pressure—

Mason Regulator Co., Boston, Mass.

REGULATORS, Upholsterers'—

Tuck Mfg. Co., Brockton, Mass.

REGULATORS, Wind Mill—

Sandwich Enterprise Co., Sandwich, Ill.
 Stover Mfg. Co., Freeport, Ill.

RELOADING CARTRIDGE TOOLS—See Tools, Reloading, Cartridge.**REPAIR KITS, COBBLERS'—See Cobblers' Kits.****REPAIR LINKS—See Links, Repair.****REPAIR MATERIALS, Iron Casting—**

Smooth On Mfg. Co., Jersey City, N. J.

RE-SAWING MACHINERY—

Egan Co., Cincinnati, O.

RESISTANCE WIRE—See Wires, Electrical.**RESTS, Arm, Bookkeepers', &c.—**

Globe-Wernicke Co., Cincinnati, O.

RESTS, Cigar—

Taplin Mfg. Co., Forestville, Ct.

RESTS, Foot, Shoe Blacking—

Chicago Spring Butt Co., Chicago, Ill.
John C. Kupferle, St. Louis, Mo.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Star Heel Plate Co., Newark, N. J.
Wrightsville Hardware Co., Wrightsville, Pa.

RESTS, MEAT, WIRE—See Household Articles, Wire.**RESTS, SHIRT, WIRE—See Household Articles, Wire.****RETORTS, Clay—**

Cyrus Borgner, Philadelphia, Pa.
Henry Maurer & Son, 420 East 23d St., New York.
Chas. Taylor's Sons Co., Cincinnati, O.

REVOLVERS—See Pistols and Revolvers.**RHEOSTAT CABLE—See Wires, Electrical.****RHEOSTATS—**

Cutler-Hammer Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Mason Regulator Co., Boston, Mass.

RIBBON, Sash—

Caldwell Mfg. Co., Rochester, N. Y.

RIDDLES AND SIEVES—

Cleveland Facing Mill Co., Cleveland, O.
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Forest City Steel & Iron Co., Cleveland, O.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Howard & Morse, 45 Fulton St., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Osborn Mfg. Co., Cleveland, O.
J. W. Paxson Co., Philadelphia, Pa.
Scheeler's Sons, Buffalo, N. Y.
W. S. Tyler Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

RIDGING, Iron—

Garry Iron & Steel Roofing Co., Cleveland, O.
Mosely Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.

RIFFLERS, Bent—

Nicholson File Co., Providence, R. I.

RIFLES, CARBINES, &c.—

Marlin Fire Arms Co., New Haven, Ct.
Remington Arms Co., 313 Broadway, N. Y.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

RIFLING MACHINES, Gun Barrel—

Pratt & Whitney Co., Hartford, Ct.

RIFT SAWS—See Saws, Rift.**RIM ROLLING MACHINES, Bicycle—**

Blake & Johnson, Waterbury, Ct.

RIMS, Bicycle—See Bicycle Parts.**RING BOLTS, GAUGES—See Bolts, Gauges.****RING MACHINES, Wire—**

E. W. Bliss Co., Brooklyn, N. Y.
Mossberg & Granville Mfg. Co., Providence, R. I.
F. B. Shuster Co., New Haven, Ct.

RINGS AND RINGERS, Hog—

F. E. Kohler & Co., Canton, O.

RINGS, Bull—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

RINGS, Clinch—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Rhode Island Tool Co., Providence, R. I.

RINGS, Flush—

Norwalk Lock Co., South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.

RINGS, Hitching—

Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
Wire Goods Co., Worcester, Mass.

RINGS, Key—

Billings & Spencer Co., Hartford, Ct.
L. T. Snow, New Haven, Ct.

RINGS, Malleable, Brass, &c.—

W. & J. Tiebout, 118 Chambers St., N. Y.

RINGS, Napkin, Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.

RINGS ON PLATES—

W. & J. Tiebout, 118 Chambers St., N. Y.

RINGS, Piston—

Samuel Trethewey & Co., Pittsburgh, Pa.

RINGS, Reducing—

Adams Co., Dubuque, Wis.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

RINGS, RUBBER—See Gaskets and Rings, Rubber.**RINGS, Stake—**

Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.

RINGS, TOWEL—See Racks and Rings.**RINGS, Triangle—**

Wheeling Hinge Co., Wheeling, W. Va.

RIPPING CHISELS—See Chisels, Floor and Ripping.**RIVET CLIPPERS, HEADERS, RODS—See Clippers, Headers, Rods.****RIVET DRILLING MACHINES—**

F. B. Shuster Co., New Haven, Ct.

RIVETED PIPE PLANTS—See Pipe Plants, Riveted.**RIVETED WORK—See Buildings and Bridges.****RIVETERS, Bicycle Chain—**

McCabe Hanger Mfg. Co., 533-543 West 22d St., New York.
F. B. Shuster Co., New Haven, Ct.

RIVETERS, Hand—

Hartman Mfg. Co., Ellwood City, Pa.
Orangeville Agricultural Works & Foundry, Orangeville, Pa.

RIVETERS, Hydraulic—

Philadelphia Roll & Machine Co., Philadelphia, Pa.
Wickes Bros., Saginaw, Mich.
R. D. Wood & Co., Philadelphia, Pa.

RIVETERS, Pneumatic—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Chicago Pneumatic Tool Co., Chicago, Ill.
Clayton Air Compressor Works, 26 Cortlandt St., N. Y.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Standard Pneumatic Tool Co., Chicago, Ill.

RIVETERS, Portable—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Wickes Bros., Saginaw, Mich.

RIVETERS, Steam—

Bement, Miles & Co., Philadelphia, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.

RIVETING MACHINERY—

Bement, Miles & Co., Philadelphia, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Garvin Machine Co., Spring & Varick Sts., New York.
Hilles & Jones Co., Wilmington, Del.
Harvey Hubbell, Bridgeport, Ct.
Long & Allstatter Co., Hamilton, O.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
F. B. Shuster Co., New Haven, Ct.
Watson-Stillman Co., 204-210 East 43d St., New York.
Wickes Bros., Saginaw, Mich.
Williams, White & Co., Moline, Wis.
R. D. Wood & Co., Philadelphia, Pa.

RIVET IRON—See Iron, Rivet.**RIVET MACHINERY—**

Acme Machinery Co., Cleveland, O.
Blake & Johnson, Waterbury, Ct.
E. J. Manville Machine Co., Waterbury, Ct.
Wm. O. Sweetser, Brockton, Mass.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

RIVETS AND BURRS, Copper—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Merchant & Co., Philadelphia, Pa.
Plume & Atwood Mfg. Co., Waterbury, Ct.
C. C. & E. P. Townsend, New Brighton, Pa.
Waterbury Brass Co., Waterbury, Ct.

RIVETS, Brass—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Blake & Johnson, Waterbury, Ct.
Clark & Cowles, Plainville, Ct.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.

RIVET SETS, TONGS—See Sets, Tonga.**RIVET WIRE—See Wire, Rivet.****RIVETS, Braziers—**

Hendricks Brothers, 42 Cliff St., N. Y.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Scovill Mfg. Co., Waterbury, Ct.
Stover Mfg. Co., Freeport, Ill.

RIVETS, Clinch—

Grand Crossing Tack Co., Chicago, Ill.

RIVETS, Hinge—

Grand Crossing Tack Co., Chicago, Ill.

RIVETS, Iron and Steel—

American Iron & Steel Mfg. Co., Lebanon, Pa.
American Screw Co., Providence, R. I.
American Steel & Wire Co., Chicago, Ill.
Blake & Johnson, Waterbury, Ct.
Burden Iron Co., Troy, N. Y.
Clark & Cowles, Plainville, Ct.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
Milwaukee Tack Co., Milwaukee, Wis.
Franklin Moore Co., Winsted, Ct.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
C. C. & E. P. Townsend, New Brighton, Pa.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
Wright & Colton Wire Cloth Co., Worcester, Mass.

RIVETS, Oyster—

W. & J. Tiebout, 118 Chambers St., N. Y.

ROAD ROLLERS, SCRAPERS—See Rollers, Scrapers.**ROASTERS, Coffee—**

Lane Bros. Co., Poughkeepsie, N. Y.

ROASTING AND BAKING PANS—See Pans, Roasting and Baking.**ROCKER SPRINGS—See Springs, Rocker.****ROD, Bright Machine Screw—**

Cleveland Wire Spring Co., Cleveland, O.

ROD CUTTERS, HEADERS—See Cutters, Headers.**ROD REELS, WIRE—See Reels, Wire Rod.****RODS, Awning—**

Garland Chain Co., Rankin Station, Pa.

RODS, Bessemer Coppered—

American Steel Wire Co., Chicago, Ill.

RODS, Black Steel—

Kidd Bros. & Burgher Steel Wire Co., McKees Rocks, Pa.

RODS, BRASS, COPPER—See Brass and Copper Rods.

RODS, Connecting—
Frankford Steel Co., Ellwood City, Pa.

RODS, Curtain—
Ludlow-Saylor Wire Co., St. Louis, Mo.

RODS, Dental Octagon—
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

RODS, Drill—
American Steel & Wire Co., Chicago, Ill.
Hermann Boker & Co., 101 Duane St., N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
Geo. Nash & Co., Chicago, Ill.
Wheelock, Lovejoy & Co., 23 Cliff St., N. Y.

RODS, Gauging, &c.—
Stanley Rule & Level Co., New Britain, Ct.

RODS, Gun Screw—
Cleveland Wire Spring Co., Cleveland, O.

RODS, Hitching Post—See Hitching Post Rods.

RODS, Key—
Pittsburgh Steel Shafting Co., Pittsburgh, Pa.

RODS, Measuring—
Buffalo Scale Co., Buffalo, N. Y.

RODS, Miter—
National Saw Co., Newark, N. J.

RODS, Nail and Rivet—
American Steel & Wire Co., Chicago, Ill.
Wheelock, Lovejoy & Co., 23 Cliff St., N. Y.
Arthur C. Harvey Co., Boston, Mass.
A. Milne & Co., 1 Broadway, New York.
Wm. & Harvey Rowland, Philadelphia, Pa.

RODS, Piston—
Finished Steel Co., Youngstown, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.
Pittsburgh Steel Shafting Co., Pittsburgh, Pa.

RODS, Pump—
American Steel & Wire Co., Chicago, Ill.
Finished Steel Co., Youngstown, O.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.

RODS, Roller Bearing—
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

RODS, Saw—
E. C. Atkins Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Charles Parker Co., Meriden, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

RODS, Screw—
American Steel & Wire Co., Chicago, Ill.
Finished Steel Co., Youngstown, O.

RODS, Steel Drill—
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

RODS, Stove—
American Screw Co., Providence, R. I.
Troy Nickel Works, Albany, N. Y.

RODS, Tap and Reamer—
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

RODS, Tie—
American Iron & Steel Mfg. Co., Lebanon, Pa.

RODS, Wire—
American Steel & Wire Co., Chicago, Ill.
Ashland Steel Co., Ashland, Ky.
Dillon-Griswold Wire Co., Sterling, Ill.
Grand Crossing Tack Co., Grand Crossing, Chicago, Ill.
Illinois Steel Co., Chicago, Ill.
A. Milne & Co., 1 Broadway, New York.
Morgan Spring Co., Worcester, Mass.
B. Nicoll & Co., 66 Wall St., New York.
S. & C. Wardlow, 95 John St., New York.

ROD TAPERING MILLS—See Mills, Rod Tapering.

ROLL BRASS, BRONZE, COPPER—See Brass, Bronze, Copper.

ROLLER BEARINGS, SKATES, STAYS—See Bearings, Skates, Stays.

ROLLER BEARING STEEL—See Steel, Roller Bearing.

ROLLERS, Door—
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
Wrightsville Hardware Co., Wrightsville, Pa.

ROLLERS, Garden—
R. W. Whitehurst & Co., Norfolk, Va.

ROLLERS, Land—
O. S. Kelly Co., Springfield, O.
R. W. Whitehurst & Co., Norfolk, Va.
J. K. Wilder & Sons, Monroe, Mich.

ROLLERS, Lawn—
Lansing Wheelbarrow Co., Lansing, Mich.
R. W. Whitehurst & Co., Norfolk, Va.

ROLLERS, Road—
Thos. Carlin's Sons, Allegheny, Pa.
O. S. Kelly Co., Springfield, O.
Mesta Machine Co., Pittsburgh, Pa.
Orangeville Agricultural Works & Foundry, Orangeville, Pa.

ROLLERS, Sash—
Ney Mfg. Co., Canton, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
W. & J. Tiebout, 118 Chambers St., N. Y.

ROLLERS, Stay—
Chicago Spring Butt Co., Chicago, Ill.
Janesville Hay Tool Co., Janesville, Wis.
Lawrence Bros., Sterling, Ill.
Louden Machinery Co., Fairfield, Ia.
Wilcox Mfg. Co., Aurora, Ill.

ROLLERS, Towel—
Crescent Brass & Iron Co., Detroit, Mich.
Logan & Strobridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

ROLLING BOXES—See Boxes, Rolling.

ROLLING MACHINES, Bicycle Rim—See Rim Rolling Machines, Bicycle.

ROLLING MILL GAUGES—See Gauges, Rolling Mill.

ROLLING MILL MACHINERY—
Allentown Rolling Mills, Allentown, Pa.
E. F. Allis & Co., Milwaukee, Wis.
Blake & Johnson, Waterbury, Ct.
Lloyd Booth Co., Youngstown, O.
Diamond Drill & Machine Co., Birdsboro, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
Frank-Kneeland Machine Co., Pittsburgh, Pa.
A. Garrison Foundry Co., Pittsburgh, Pa.
S. V. Huber & Co., Pittsburgh, Pa.
Marshall & Huchart Machinery Co., Chicago, Ill.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niles Tool Works Co., Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
F. R. Phillips' Son Co., Philadelphia, Pa.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
R. Poole & Son Co., Baltimore, Md.
E. H. Stroud & Co., Chicago, Ill.
Hugh L. Thompson, Waterbury, Ct.
Wm. Tod & Co., Youngstown, O.
Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.
Wals & Roos Punch & Shear Co., Cincinnati, O.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Wellman-Seaver Engineering Co., Cleveland, O.
Youngstown Foundry & Machine Co., Youngstown, O.

ROLLING PINS—See Pins, Rolling.

ROLL PAPER HOLDERS AND CUTTERS—See Holders and Cutters, Roll Paper.

ROLLS, Beam Bending—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Thomas Carlin's Sons, Allegheny, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

ROLLS, Bending and Straightening—

Bement, Miles & Co., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Thos. Carlin's Sons, Wilmington, Del.
Diamond Drill & Machine Co., Birdsboro, Pa.
Hilles & Jones Co., Wilmington, Del.
New Doty Mfg. Co., Janesville, Wis.
Niagara Machine & Tool Works, Buffalo, N. Y.
Niles Tool Works Co., Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Wals & Roos Punch & Shear Co., Cincinnati, O.
Whitcomb Mfg. Co., Worcester, Mass.
Wickes Bros., Saginaw, Mich.

ROLLS, Crimping—

Bertsch & Co., Cambridge City, Ind.
New Doty Mfg. Co., Janesville, Wis.
Niagara Machine & Tool Works, Buffalo, N. Y.

ROLLS, Crushing—

E. P. Allis Co., Milwaukee, Wis.
Thos. Carlin's Sons, Allegheny, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Diamond Drill & Machine Co., Birdsboro, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.

ROLLS, Forging—

Ajax Mfg. Co., Cleveland, O.

ROLLS, Hand and Belt Power, Bending—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
New Doty Mfg. Co., Janesville, Wis.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Whitcomb Mfg. Co., Worcester, Mass.
Wickes Bros., Saginaw, Mich.

ROLLS, Hardened Forged Steel—

Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Samuel Trethewey & Co., Pittsburgh, Pa.

ROLL SHELLS—See Shells, Roll.

ROLLS, Jewelers'—

Blake & Johnson, Waterbury, Ct.
E. J. Manville Machine Co., Waterbury, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.

ROLLS, Paper—

Farrel Foundry & Mach. Co., Ansonia, Ct.

ROLLS, Rubber Covered—

Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

ROLLS, Sand, Chilled and Steel—

Lloyd Booth Co., Youngstown, O.
Diamond Drill & Machine Co., Birdsboro, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
Frankford Steel Co., Ellwood City, Pa.
Frank-Kneeland Machine Co., Pittsburgh, Pa.
A. Garrison Foundry Co., Pittsburgh, Pa.
Lorain Foundry Co., Lorain, O.
Mesta Machine Co., Pittsburgh, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
F. R. Phillips' Sons, Philadelphia, Pa.
Seaman-Sleeth Co., Pittsburgh, Pa.
E. H. Stroud & Co., Chicago, Ill.
Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.
Youngstown Foundry & Machine Co., Youngstown, O.

ROLL TOP DESKS—See Desks, Roll and Flat Top.

ROOF BOLTS, RODS—See Bolts, Rods.

ROOF CUTTER IRONS—See Irons, Roof Cutter.

ROOFING BRACKETS, CEMENT, TONGS—See Brackets, Cement, Tongs.

ROOFING, Iron and Steel—

Berlin Iron Bridge Co., East Berlin, Ct.
Forest City Steel & Iron Co., Cleveland, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.
Chas. E. McInnes & Co., Philadelphia, Pa.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., New York.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Shiffler Bridge Co., Pittsburgh, Pa.
W. H. Thomas & Co., Philadelphia, Pa.
Youngstown Iron & Steel Roofing Co.,

ROOFING, METAL—See Corrugated Iron.**ROOFING PLATES—**

American Tin Plate Co., Battery Park Building, New York.

ROOFS—See Buildings and Bridges.**ROOMS, COOLING—See Cooling Rooms for Butchers, &c.****ROOT, TOBACCO CUTTERS—See Cutters, Tobacco, Root.****ROPE, Braided Cotton, Linen, &c.—**

Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

ROPE, CLAMPS, CLIPS, &c.—See Clamps, Clips, &c.**ROPE COATING FILLER—See Coating, Filler.****ROPE, Cotton—**

A. Leschen & Sons Rope Co., St. Louis, Mo.

ROPE, Hay—

A. Leschen & Sons Rope Co., St. Louis, Mo.
J. W. Paxson Co., Philadelphia, Pa.

ROPE, Hide—

A. Leschen & Sons Rope Co., St. Louis, Mo.

ROPE, Manila, Sisal and Hemp—

American Mfg. Co., 85 Wall St., New York.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Waterbury Rope Co., 99 South St., N. Y.
T. B. Woods' Sons, Chambersburg, Pa.

ROPES, Hammock and Hitching—

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
I. E. Palmer, Middletown, Ct.
Samson Cordage Works, Boston, Mass.

ROPES, Locomotive Switching—

American Steel & Wire Co., Chicago, Ill.

ROPE TRANSMISSION, Power—

American Mfg. Co., 65 Wall St., New York.
California Wire Works, San Francisco, Cal.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.
F. W. Iredell, 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.
C. W. Hunt Co., West New Brighton, N. Y.
A. Leschen & Sons Rope Co., Ltd., St. Louis, Mo.
Link-Belt Engineering Co., Philadelphia.
Samson Cordage Works, Boston, Mass.
T. B. Woods' Sons, Chambersburg, Pa.

ROPE, Wire—

American Steel & Wire Co., Chicago, Ill.
Broderick & Bascom Rope Co., St. Louis.
California Wire Works, San Francisco, Cal.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia.
Trenton Iron Co., Trenton, N. J.
Waterbury Rope Co., 69 South St., N. Y.
Williamsport Wire Rope Co., Williamsport, Pa.

ROSETTES, Iron—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
John W. Clark, Albany, N. Y.
Chas. G. Eckstein & Co., 249 Center St., New York.
Keystone Drop Forge Co., Philadelphia.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

ROUNDS, Ladder—

Lansing Wheelbarrow Co., Lansing, Mich.

ROUNDERS, SAW—See Saw Guides and Rounders.**ROWLOCKS—**

W. & J. Tiebout, 118 Chambers St., N. Y.

RUBBER BAGS—See Bags, Rubber.**RUBBER BELTING, CEMENT, &c.—See Belting, Cement, &c.****RUBBER COVERED WIRE—See Wire, Electrical.****RUBBER GOODS, Mechanical—**

Boston Belting Co., Boston, Mass.
H. O. Canfield, Bridgeport, Ct.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

RUBBER MACHINERY—

Farrel Foundry & Mach. Co., Ansonia, Ct.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

RUBBER MANUFACTURERS' SUPPLIES—

Hoggson & Pettis Mfg. Co., New Haven, Ct.

RUBBER RINGS—See Gaskets and Rings, Rubber.**RUBBER, Scrap—**

Theodore Hofeller & Co., Buffalo, N. Y.

RUBBER SHEETS, VULCANIZED—See Sheet Rubber, Vulcanized.**RUBBER, SOLING—See Soling Rubber.****RUBBING BEDS—**

F. R. Patch Mfg. Co., Rutland, Vt.

RUB IRONS—See Irons, Rub.**RUBS, Emery—See Emery Rubs for Foundry Use.****RUDDER BRACES—See Braces, Rudder.****RULES, Board and Log—**

Lufkin Rule Co., Saginaw, Mich.

RULES, Boxwood—

Brown & Sharpe Mfg. Co., Providence, R. I.
C. E. Jennings Co., 101 Reade St., N. Y.
Stanley Rule & Level Co., New Britain, Ct.

RULES, Glaziers'—

Lufkin Rule Co., Saginaw, Mich.

RULES, Ivory—

C. E. Jennings Co., 101 Reade St., N. Y.
Stanley Rule & Level Co., New Britain, Ct.

RULES, Machinists'—

Athol Machine Co., Athol, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
L. S. Starrett Co., Athol, Mass.

RULES, Metric Steel—

Brown & Sharpe Mfg. Co., Providence, R. I.
Lufkin Rule Co., Saginaw, Mich.

RULES, Scale and Shrinkage—

Brown & Sharpe Mfg. Co., Providence, R. I.
L. S. Starrett Co., Athol, Mass.

RULES, Steel—

Henry Disston & Sons, Philadelphia, Pa.
Lufkin Rule Co., Saginaw, Mich.
Sawyer Tool Co., Fitchburg, Mass.

RULES, Steel Caliper—

Brown & Sharpe Mfg. Co., Providence, R. I.

RULES, Tinners'—

Lufkin Rule Co., Saginaw, Mich.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

RUMBLING MACHINES, Wire Nail—

Bates Machine Co., Joliet, Ill.

RUNNER ATTACHMENTS, Bob Sled—

Lansing Wheelbarrow Co., Lansing, Mich.

RUNNERS, Bob Sled—

Sidney Steel Scraper Co., Sidney, O.

RUNS, HOUSE AND CAR—See Ice Harvesting Tools.**RUST REPELLER—**

Marlin Fire Arms Co., New Haven, Ct.

SADDLERS' HAMMERS—See Hammers, Saddlers' and Upholsterers'.**SADDLERY HARDWARE—**

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
W. & E. T. Fitch Co., New Haven, Ct.
Homer F. Livermore, Boston, Mass.
Imperial Bit & Snap Co., Racine, Wis.

SADDLES, Bicycle—

Bridgeport Gun Implement Co., 313 Broadway, New York.

SAD IRON HANDLES, HEATERS, STANDS—See Handles, Heaters, Stands.**SAD IRONS—See Irons, Sad Laundry, &c.****SAFE PLATE—**

Brown & Co., Inc., Pittsburgh, Pa.

SAFES, Cheese—

E. T. Barnum, Detroit, Mich.

SAFES, Fire and Burglar Proof—

Chicago Scale Co., Chicago, Ill.

SAFES, Match—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Charles Parker Co., Meriden, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Scovill Mfg. Co., Waterbury, Ct.
Sidney Shepard & Co., Buffalo, N. Y.
Sam'l C. Tatum Co., Cincinnati, O.
A. C. Williams, Ravenna, O.

SAFES, Provision—

Howard & Morse, 45 Fulton St., New York.

SAFETY CHAIN, PINS, VALVES—See Chain, Pins, Valves.**SAIL MAKERS' PALMS—See Palms, Sailors' and Sail Makers'.****SALAD CASTERS—See Casters, Silver Plated.****SALAD SERVERS—See Servers, Salad.****SALAMANDERS—See Stoves, Plasterers'.****SALT MACHINERY—**

Variety Machine Co., Warsaw, N. Y.

SALTS—See Peppers and Salts, Silver Plated.**SALTS, Shaker—**

Fred. J. Meyers Mfg. Co., Hamilton, O.

SAMPLE HOLDERS—See Holders, Sample.**SAND AND MUD HUB BANDS—See Bands, Vehicle Wheel, Sand and Mud.****SAND BLAST MACHINERY—**

Geo. Nash & Co., Chicago, Ill.
Edgar T. Ward & Sons, Boston, Mass.

S AND S HOOKS—See Hooks, S and S.**SAND, Fire—**

Cleveland Facing Mill Co., Cleveland, O.
Henry Maurer & Son, 420 E. 23d St., N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Chas. Taylor's Sons Co., Cincinnati, O.
M. D. Valentine & Bro. Co., Woodbridge, N. J.

SAND MIXING MACHINES, ROLLS, SIFTERS—See Mixing Machines, Rolls, Sifters.**SANDPAPER—See Paper, Sand, Garnet, &c.****SANDPAPERING MACHINES—**

J. A. Fay & Co., Cincinnati, O.

SAP PAILS, SPOUTS—See Pails, Spouts.**SASH BALANCES, CENTERS, &c.—See Balances, Centers, &c.****SASH, DOOR AND BLIND MACHINERY—**

J. A. Fay & Co., Cincinnati, O.

SASH, IRON—See Iron Work, Builders'.**SATURATING MACHINES FOR TAR PAPER—**

Farrel Foundry & Mach. Co., Ansonia, Ct.

SAUSAGE STUFFERS—See Stuffers, Sausage.**SAUCEPANS, Copper—See Ware, Copper.****SAVINGS BANKS, TOY—See Toy Savings Bank.****SAW ARBORS, BUCKS, &c.—See Arbors, Bucks, &c.****SAW DUST, Boxwood—**

Samuel Winslow Mfg. Co., Worcester, Mass.

SAW FILERS—See Filers, Saw.**SAW GRINDERS AND ROUNDERS—**

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
Simonds Mfg. Co., Fitchburg, Mass.

SAW GUIDES, BAND—See Guides, Band Saw.**SAW HANDLES, CROSSCUT—See Handles, Crosscut Saw.****SAWING MACHINES, Band—**

Egan Co., Cincinnati, O.
Wickes Bros., Saginaw, Mich.

SAWING MACHINES, Metal—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Pratt & Whitney Co., Hartford, Ct.
Lucas & Gilem, Philadelphia, Pa.
Niles Tool Works Co., Hamilton, O.
Marshall & Huschart Machinery Co., Chicago, Ill.
Q & C Company, Chicago, Ill.

SAWING MACHINES, Slate and Stone—

F. R. Patch Mfg. Co., Rutland, Vt.

SAWING MACHINES, Wood—

American Machinery Co., Grand Rapids, Mich.
R. E. Kidder, Worcester, Mass.
Orangeville Agricultural Works & Foundry, Orangeville, Pa.

SAW MILL DOGS, TRUCKS—See Dogs, Trucks.**SAW MILL MACHINERY—**

E. P. Allis Co., Milwaukee, Wis.
Egan Co., Cincinnati, O.
Filer & Stowell Co., Milwaukee, Wis.
Lane & Bodley Co., Cincinnati, O.
Link-Belt Engineering Co., Philadelphia.
Wickes Bros., Saginaw, Mich.

SAWS, Band—

Edw. P. Allis Co., Milwaukee, Wis.
American Machinery Co., Grand Rapids, Mich.
E. C. Atkins & Co., Indianapolis, Ind.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Henry Disston & Sons, Philadelphia, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Peter Gerlach & Co., Cleveland, O.
Hill, Clarke & Co., Boston, Mass.
J. W. Paxson Co., Philadelphia, Pa.
National Saw Co., Newark, N. J.
Silver Mfg. Co., Salem, O.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Band for Metal—

E. C. Atkins Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
Lucas & Gilem, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Pratt & Whitney Co., Hartford, Ct.

SAWS, Butcher, Kitchen, &c.—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
Millers Falls Co., 28 Warren St., New York.
National Saw Co., Newark, N. J.

SAWS, Circular—

E. C. Atkins & Co., Indianapolis, Ind.
W. F. & John Barnes Co., Rockford, Ill.
Henry Disston & Sons, Philadelphia, Pa.
Egan Co., Cincinnati, O.
Filer & Stowell Co., Milwaukee, Wis.
Peter Gerlach & Co., Cleveland, O.
National Saw Co., Newark, N. J.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Coping—

Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.

SAWS, Cylinder—

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.

SAWS, Dehorning—

E. C. Atkins & Co., Indianapolis, Ind.
W. F. & John Barnes Co., Rockford, Ill.
Geo. H. Bishop & Co., Lawrenceburg, Ind.
Henry Disston & Sons, Philadelphia, Pa.
Millers Falls Co., 28 Warren St., New York.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Diamond Stone—

Farrel Foundry & Mach. Co., Ansonia, Ct.

SAW SETTING AND FILING MACHINES, BAND—See Setting and Filing Machines, Band Saw.**SAWS, Gauge—**

Henry Disston & Sons, Philadelphia, Pa.

SAWS, Grooving—

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Hack, and Hack Saw Blades—

Arcade Mfg. Co., Freeport, Ill.
Henry Disston & Sons, Philadelphia, Pa.
Goodell-Pratt Co., Greenfield, Mass.
C. E. Jennings Co., 101 Reade St., N. Y.
Marshall & Huschart Machinery Co., Chicago, Ill.
Millers Falls Co., 28 Warren St., New York.
National Saw Co., Newark, N. J.
Springfield Machine Screw Co., Springfield, Mass.
Tower & Lyon, 95 Chambers St., New York.

SAWS, Hand, Panel, Back, &c.—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
National Saw Co., Newark, N. J.

SAWS, Hot Metal—

Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Philadelphia Roll & Machine Co., Philadelphia, Pa.

SAWS, Ice—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
V. Clad & Sons, Philadelphia, Pa.
Henry Disston & Sons, Philadelphia, Pa.
Peter Gerlach & Co., Cleveland, O.
C. E. Jennings Co., 101 Reade St., N. Y.
National Saw Co., Newark, N. J.
W. T. Wood & Co., Arlington, Mass.

SAWS, Jewelers—

Millers Falls Co., 28 Warren St., New York.

SAWS, Metal—

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Q & C Company, Chicago, Ill.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Metal Slitting—

Brown & Sharpe Mfg. Co., Providence, R. I.
Henry Disston & Sons, Philadelphia, Pa.
Pratt & Whitney Co., Hartford, Ct.

SAWS, Mill, Mulay, Crosscut, Drag, Gang, Pit, Whip, &c.—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
Peter Gerlach & Co., Cleveland, O.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Plumbers—

Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
National Saw Co., Newark, N. J.

SAWS, Power, Hack—

Henry Disston & Sons, Philadelphia, Pa.
Hofer Mfg. Co., Freeport, Ill.
Millers Falls Co., 28 Warren St., New York.
National Saw Co., Newark, N. J.

SAWS, Pruning—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
National Saw Co., Newark, N. J.

SAWS, Rift—

E. C. Atkins Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.

SAWS, Scroll, and Scroll Saw Blades—

E. C. Atkins & Co., Indianapolis, Ind.
W. F. & John Barnes Co., Rockford, Ill.
Henry Disston & Sons, Philadelphia, Pa.
Egan Co., Cincinnati, O.
Millers Falls Co., 28 Warren St., New York.
National Saw Co., Newark, N. J.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Segment or Veneering—

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

SAWS, Slitting—

Henry Disston & Sons, Philadelphia, Pa.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.

SAWS, Tube—

Henry Disston & Sons, Philadelphia, Pa.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

SAWS, Wood, and Wood Saw Blades—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
National Saw Co., Newark, N. J.
Stover Mfg. Co., Freeport, Ill.

SAW TOOTH GAUGES—See Gauges, Saw Tooth.**SCAFFOLDS—**

Portland Ladder Co., Newark, N. J.

SCALE ATTACHMENTS, Recording, Registering, &c.—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALE BEAMS—

John Chatillon & Sons, 85 Cliff St., N. Y.
Chicago Scale Co., Chicago, Ill.
Fairbanks Co., 311 Broadway, New York.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

SCALERS, Fish—

Covert's Saddlery Works, Farmer N. Y.
Reading Hardware Co., Reading, Pa.

SCALES, Abattoir and Butcher—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Army and Navy—

Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, ASSAY—See Assay Balances and Scales.**SCALES, Candy—**

John Chatillon & Sons, 85 Cliff St., N. Y.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Cement Testing—

Fairbanks Co., 311 Broadway, New York.

SCALES, Cheese—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Coal, Mine and Tipple—

Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Cotton and Wool—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Counter—

John Chatillon & Sons, 85 Cliff St., N. Y.
Chicago Scale Co., Chicago, Ill.
Fairbanks Co., 311 Broadway, New York.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
I. S. Spencer's Sons, Guilford, Ct.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Dormant, Warehouse—

Chicago Scale Co., Chicago, Ill.
Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Draftsmen's—

Brown & Sharpe Mfg. Co., Providence, R. I.

SCALES, Family—

American Cutlery Co., Chicago, Ill.
John Chatillon & Sons, 85 Cliff St., N. Y.
Fairbanks Co., 311 Broadway, New York.
North Bros. Mfg. Co., Philadelphia, Pa.
I. S. Spencer's Sons, Guilford, Ct.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Fish—

Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.
Wrightsville Hardware Co., Wrightsville, Pa.

SCALES, Furnace Charging and Foundry—

Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Glass Works—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Graduated—

Brown & Sharpe Mfg. Co., Providence, R. I.

SCALES, Grain and Elevator—

Fairbanks Co., 311 Broadway, New York.
Pratt & Whitney Co., Hartford, Ct.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Hanging Hopper Beam—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Ice—

Pelouze Scale & Mfg. Co., Chicago, Ill.

SCALES, Leather Inspectors—

John Chatillon & Sons, 85 Cliff St., N. Y.

SCALES, Letter, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

SCALES, Lifting—

John Chatillon & Sons, 85 Cliff St., N. Y.

SCALES, Ore, Metal and Pig Iron—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Personal—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Platform—

John Chatillon & Sons, 85 Cliff St., N. Y.
Chicago Scale Co., Chicago, Ill.
Fairbanks Co., 311 Broadway, New York.
C. W. Hunt Co., West New Brighton, N. Y.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Postal—

John Chatillon & Sons, 85 Cliff St., N. Y.
Fairbanks Co., 311 Broadway, New York.

SCALES, Professional—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, R. R. Track—

Chicago Scale Co., Chicago, Ill.
Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Reverse Acting Meat Beam—

Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Stock, Wagon and Hay—

Chicago Scale Co., Chicago, Ill.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Suspension—

John Chatillon & Sons, 85 Cliff St., N. Y.
Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Union—

John Chatillon & Sons, 85 Cliff St., N. Y.
Fairbanks Co., 311 Broadway, New York.
Standard Scale & Supply Co., Ltd., Pittsburgh, Pa.

SCALES, Yarn—

Brown & Sharpe Mfg. Co., Providence, R. I.

SCHOOL OUTFITS, Manual Training—

Buffalo Forge Co., Buffalo, N. Y.

SCHOOLS, Manual Training—

Washburn Shops, Worcester, Mass.

SCISSORS—See Shears and Scissors.**SCOOP FORKS, Vegetable, Beet, Potato, &c.—**

Iowa Farming Tool Co., Fort Madison, Ia.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.
Withington & Cooley Mfg. Co., Jackson, Mich.

SCOOP NETS—See Nets, Scoop.**SCOOPS, Candy—**

John Chatillon & Sons, 85 Cliff St., N. Y.

SCOOPS, Cheest—

American Cutlery Co., Chicago, Ill.

SCOOPS, FURNACE—See Shovels and Scoops, Furnace.**SCOOPS, Grain, Coal, &c.—**

Avery Stamping Co., Cleveland, O.
Havana Metal Wheel Co., Havana, Ill.
New Castle Shovel Co., New Castle, Pa.
St. Louis Shovel Co., St. Louis, Mo.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.

SCOOPS, Wood—

John Sommer's Son, Newark, N. J.

SCRAP—See Material, Old.**SCRAPERS AND BUFFER STEELS—See Steels, Buffer and Scraper.****SCRAPERS, Box—**

Braunsdorf-Mueller Co., Elizabeth, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stanley Rule & Level Co., New Britain, Ct.
Sam'l C. Tatum Co., Cincinnati, O.

SCRAPERS, Butchers' Block—

National Saw Co., Newark, N. J.

SCRAPERS, Cabinet and Bench—

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Dighton & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
Sam'l C. Tatum Co., Cincinnati, O.

SCRAPERS, Coke Oven—

Jenkins Iron & Tool Co., Howard, Pa.

SCRAPERS, Floor—

Osborn Mfg. Co., Cleveland, O.

SCRAPERS, Flue—See Cleaners, Flue.**SCRAPERS, Foot—**

Arcade Mfg. Co., Freeport, Ill.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Stover Mfg. Co., Freeport, Ill.

SCRAPERS, Hog—

W. J. Clark Co., Salem, O.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

SCRAPERS, ICE—See Ice Harvesting Tools.**SCRAPERS, Kettle—**

F. E. Kohler & Co., Canton, O.
N. R. Streeter & Co., Rochester, N. Y.

SCRAPERS, Machinists—

Nicholson File Co., Providence, R. I.

SCRAPERS, Plumbers—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

SCRAPERS, Road—

American Steel Scraper Co., Sidney, O.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Sidney Steel Scraper Co., Sidney, O.
Syracuse Chilled Plow Co., Syracuse, N. Y.
J. K. Wilder & Sons, Monroe, Ct.

SCRAPERS, Shovel—

Arcade Mfg. Co., Freeport, Ill.

SCRAPERS, Veneer—

Stanley Rule & Level Co., New Britain, Ct.

SCRAPERS, Walk and Street—

F. E. Kohler & Co., Canton, O.
Iowa Farming Tool Co., Fort Madison, Ia.

SCRAPERS, Wall—

C. E. Jennings Co., 101 Reade St., N. Y.
National Saw Co., Newark, N. J.

SCRATCH AWLS, GAUGES—See Awls, Gauges.**SCREEN BOLTS, DOORS, &c.—See Bolts, Doors, &c.****SCREENS, Fire, Folding—**

S. M. Howes Co., Boston, Mass.

SCREENS, Radiator—

E. T. Barnum, Detroit, Mich.
Ludlow-Saylor Wire Co., St. Louis, Mo.

SCREENS, Revolving—

Thomas Carlin's Sons, Allegheny, Pa.
Howard & Morse, 45 Fulton St., New York.
Jeffrey Mfg. Co., Columbus, O.
Littleford Bros., Cincinnati, O.

SCREENS, Sand and Coal, &c.—

E. T. Barnum, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Harrington & King Perforating Co., Chicago, Ill.
Heyl & Patterson, Pittsburgh, Pa.
Howard & Morse, 45 Fulton St., New York.
C. W. Hunt Co., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Littleford Bros., Cincinnati, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Michigan Wire Cloth Co., Detroit, Mich.
Portland Ladder Co., Newark, N. J.
Scheeler's Sons, Buffalo, N. Y.
Turner, Vaughn & Taylor Co., Cuyaboga Falls, O.
W. S. Tyler Co., Cleveland, O.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.

SCREENS, Window—

Edward Darby & Sons, Philadelphia, Pa.
Dow Wire Works Co., Louisville, Ky.

SCREENS, Window, to order only—

Phenix Mfg. Co., Milwaukee, Wis.

SCREENS, Window, Lettered—

E. T. Barnum, Detroit, Mich.

SCREEN WIRE CLOTH—See Cloth, Window Screen.**SCREW CASES—See Cases, Screw and Bolt.****SCREW CUTTING DIE HEADS—See Die Heads, Screw Cutting.****SCREW DRIVER BITS, HOLDERS—See Bits, Holders.****SCREW DRIVERS—See Drivers, Screw.****SCREW HOLDER AND DRIVER—See Drivers, Screw, and Holder.****SCREW HOOK HINGES—See Hinges, Screw Hook or Strap and Eye.****SCREW JACKS, PLATES, PRESSES, PULLEYS, WRENCHES—See Jacks, Plates, Presses, Pulleys, Wrenches.****SCREW MACHINES—**

American Tool Works Co., Cleveland, O.
Brown & Sharpe Mfg. Co., Providence, R. I.
Bullard Machine Tool Co., Bridgeport, Ct.
J. E. Costello Mach. Works, Brooklyn, N. Y.
Draper Machine Tool Co., Worcester, Mass.
Garvin Machine Co., Spring & Varick Sts., New York.
Hill, Clarke & Co., Boston, Mass.
Jones & Lamson Machine Co., Springfield, Vt.
J. J. McCabe, 14 Dey St., New York.
E. J. Manville Machine Co., Waterbury, Ct.
Marshall & Huschart Machinery Co., Chicago, Ill.
Niles Tool Works Co., Hamilton, O.
Oster Mfg. Co., Cleveland, O.
A. B. Pitkin Machinery Co., Providence, R. I.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
Spencer Automatic Machine Screw Co., Hartford, Ct.
Windsor Machine Co., Windsor, Vt.
S. M. York Co., Cleveland, O.

SCREW MACHINES, Sheet Metal—

E. W. Bliss Co., Brooklyn, N. Y.
Chas. E. Leffler & Co., Brooklyn, N. Y.

SCREW MACHINES, Tools for—

Brown & Sharpe Mfg. Co., Providence, R. I.

SCREW RODS—See Rods, Screw.**SCREWS, Bed—**

Shelton Co., Derby, Ct.

SCREWS, Bench—

R. Bliss Mfg. Co., Pawtucket, R. I.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.

SCREWS, Cap and Set—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Chicago Screw Co., Chicago, Ill.
Dodge Machine Screw Co., Boston, Mass.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
New Britain Hardware Mfg. Co., New Britain, Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Works, Rockford, Ill.
Spencer Automatic Machine Screw Co., Hartford, Ct.
Steward & Romaine Mfg. Co., Ltd., Philadelphia, Pa.
Worcester Machine Screw Co., Worcester, Mass.

SCREWS, Cap for Locks—

American Screw Co., Providence, R. I.

SCREWS, Coach and Lag—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Sam'l Hall's Sons, 229-233 W. 10th St., New York.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.
Shelton Co., Derby, Ct.
Wilson & Smith, Worcester, Mass.

SCREWS, Collar—

Chicago Screw Co., Chicago, Ill.
Dodge Machine Screw Co., Boston, Mass.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
New Britain Hardware Mfg. Co., New Britain, Ct.
Pittsburgh Screw & Collar Bolt Co., Pittsburgh, Pa.
Worcester Machine Screw Co., Worcester, Mass.

SCREWS, Cork—

Erie Specialty Co., Erie, Pa.

SCREWS, Drive—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

SCREWS, Guitar and Violin Clamp Screws—

R. Bliss Mfg. Co., Pawtucket, R. I.

SCREWS, Hand—

R. Bliss Mfg. Co., Pawtucket, R. I.

SCREWS, Hand Rail—

American Screw Co., Providence, R. I.
Van Wagoner & Williams Hardware Co., Cleveland, O.
Wire Goods Co., Worcester, Mass.

SCREWS, Hanger—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Spencer Automatic Machine Screw Co., Hartford, Ct.

SCREW SHAVING MACHINES—See Shaving Machines, Screw.**SCREWS, Hook and Eye—**

American Iron & Steel Mfg. Co., Lebanon, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
W. & J. Tiebout, 118 Chambers St., N. Y.

SCREWS, JACK—See Jack Screws.**SCREWS, Knob—**

American Screw Co., Providence, R. I.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

SCREWS, Machine—

American Screw Co., Providence, R. I.
Chicago Screw Machine Co., Chicago, Ill.
Dodge Machine Screw Co., Boston, Mass.
Harvey Hubbell, Bridgeport, Ct.
New Britain Hardware Mfg. Co., New Britain, Ct.
Philadelphia Machine Screw Works, Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Spencer Automatic Machine Screw Co., Hartford, Ct.
Worcester Machine Screw Co., Worcester, Mass.

SCREWS, Ore Washer—

American Iron & Steel Mfg. Co., Lebanon, Pa.

SCREWS, Saw—

Geo. H. Bishop & Co., Lawrenceburg, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.

SCREWS, Shutter, Store Door—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

SCREWS, Special—

Chas. H. Besly & Co., Chicago, Ill.
Blake & Johnson, Waterbury, Ct.
Bowen Mfg. Co., Auburn, N. Y.
Dodge Machine Screw Co., Boston, Mass.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Franklin S. Miles, Philadelphia, Pa.
New Britain Hardware Mfg. Co., New Britain, Ct.
Philadelphia Machine Screw Works, Philadelphia, Pa.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Spencer Automatic Machine Screw Co., Hartford, Ct.

SCREWS, Thumb—

Chas. H. Besly & Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Ct.
Chicago Screw Co., Chicago, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Keystone Drop Forge Co., Philadelphia.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Rockford Bolt Works, Rockford, Ill.
T. F. Welch Mfg. Co., Boston, Mass.

SCREW STOCK BARS—See Bars, Screw Stock.**SCREWS, Wood—**

American Screw Co., Providence, R. I.
Franklin Moore Co., Winsted, Ct.
Franklin S. Miles, Philadelphia, Pa.
Reading Hardware Co., Reading, Pa.
Reading Screw Co., Norristown, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Wright & Colton Wire Cloth Co., Worcester, Mass.

SCREW THREAD GAUGES—See Gauges, U. S. Standard Screw Thread.**SCRIBERS, Metal—**

L. S. Starrett Co., Athol, Mass.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

SCRIBERS, Timber—

Bemis & Call Hardware & Tool Co., Springfield, Mass.

SCRIBING BLOCKS—See Blocks, Scribing.**SCROLL SAWS AND SCROLL SAW BLADES—See Saws, Scroll, and Scroll Saw Blades.****SCRUB BRUSHES—See Brushes, White-wash, Horse, &c.****SCUFFLE HOES—See Hoes, Scuffle.****SCYTHES—**

Clark & Parsons Co., East Wilton, Me.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

SCYTHE SHARPENERS, STANDS, STONES—See Sharpeners, Stands, Stones.**SEAL PRESSES—See Presses, Seal.****SEALS, Notary, &c.—**

Schwerdtle & Siebert, Bridgeport, Ct.

SEALS, SEALING DEVICES, &c.—

Theo. Hertz & Son, St. Louis, Mo.
R. Woodman Mfg. & Supply Co., Boston.

SEALS, Strap—

Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

SEATS, Agricultural, Steel—

Avery Stamping Co., Cleveland, O.

SEATS, Bathtub—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

SEATS, Child's Carriage—

Imperial Bit & Snap Co., Racine, Wis.

SECOND HAND ELECTRICAL MACHINES—

Stewart Electrical Co., Cincinnati, O.

SECOND HAND MACHINERY—

Geo. E. Affleck, 100 Liberty St., New York.
American Tool Works Co., Cincinnati, O.
Jesse Atherton, Auburn, R. I.
U. Baird Machinery Co., Pittsburgh, Pa.
Marvin Briggs, 12 Broadway, New York.
Thos. Carlin's Sons, Allegheny, Pa.
Chesley Mfg. Co., Havemeyer Building, N. Y.
M. P. Coleman, Boston, Mass.
T. P. Conard, Philadelphia, Pa.
T. W. G. Cook, 4 Reade St., New York.
R. M. Cunliffe, Philadelphia, Pa.
Danielson Machine & Tool Co., Cleveland, O.
A. L. Dawson & Co., Chicago, Ill.
J. B. Doan & Co., Chicago, Ill.
B. M. Everson, Pittsburgh, Pa.
Garvin Machine Co., Spring & Varick Sts., New York.
Robt. J. Gray, 52 E. 132d St., New York.
Henry F. Hill, Boston, Mass.
J. H. Hillman & Son, Pittsburgh, Pa.
W. C. Johnson & Sons Machinery Co., St. Louis, Mo.
J. H. Kerrick, Minneapolis, Minn.
Lodge & Shipley Machine Tool Co., Cincinnati, O.
Lovegrove & Co., Philadelphia, Pa.
Thomas Lowe Machinery Co., Providence.
S. T. Lund, Boston, Mass.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Marshall & Huchart Mach. Co., Chicago.
J. J. McCabe, 14 Dey St., New York.
McDowell & Co., Pittsburgh, Pa.
McDowell, Stocker & Co., Chicago, Ill.
Frank McSwegan & Sons, 120 Liberty St., New York.
W. D. Morton Machinery Co., Cincinnati, O.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Works Co., Hamilton, O.
Paradox Machinery Co., Chicago, Ill.
Wm. H. Perry & Co., Providence, R. I.
A. B. Pitkin Machinery Co., Providence, R. I.
Poulterer & Co., Philadelphia, Pa.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
L. F. Seyfert's Sons, Philadelphia, Pa.
Silk, Anderson & Co., Cincinnati, O.
Frank Toomey, Philadelphia, Pa.
E. H. Wachs Co., Chicago, Ill.
Wash's Sons & Co., Newark, N. J.
W. W. Whitehead, Davenport, Iowa.
Wickes Bros., Saginaw, Mich.

SECTION LINERS—See Liners, Section.**SEED CASES, SOWERS—See Cases, Sowers.****SEEDERS, Broadcast—**

W. J. Adams, Joliet, Ill.

SEEDERS, CHERRY—See Stoners, Cherry.**SEEDERS, Raisin—**

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.

SEGMENTS, COMMUTATOR—See Commutator Bars and Segments.**SELLING AGENTS, HARDWARE—See Agents, Hardware Manufacturers.****SEPARATORS, Egg—**

Nelson & Lyon, Albany, N. Y.

SEPARATORS, Magnetic—

Geo. V. Cresson Co., Philadelphia, Pa.

SEPARATORS, Oil—

American Tool Works Co., Cincinnati, O.
 Bates Machine Co., Joliet, Ill.
 Harrison Safety Boiler Works, Philadelphia, Pa.
 Hill, Clarke & Co., Boston, Mass.
 Warren Webster & Co., Camden, N. J.
 Windsor Machine Co., Windsor, Vt.

SEPARATORS, Steam—

Harrison Safety Boiler Works, Philadelphia, Pa.
 Warren Webster & Co., Camden, N. J.

SERVERS, Salad—

American Cutlery Co., Chicago, Ill.

SETS, Communion, Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.

SET SCREWS—See Screws, Cap and Set.**SETS, Croquette—**

R. Bliss Mfg. Co., Pawtucket, R. I.

SETS, Garden Tool—

Arcade Mfg. Co., Freeport, Ill.
 Oliver P. Clay Co., Cleveland, O.
 Iowa Farming Tool Co., Fort Madison, Ia.
 Logan & Strobridge Iron Co., New Brighton, Pa.
 Withington & Cooley Mfg. Co., Jackson, Mich.
 Wrightsville Hardware Co., Wrightsville, Pa.

SETS, Gormmet—

Braunsdorf-Mueller Co., Elizabeth, N. J.

SETS, Nail—

Braunsdorf-Mueller Co., Elizabeth, N. J.
 Charles Buck, Milbury, Mass.
 Buck Bros., Milbury, Mass.
 Goodell-Pratt Co., Greenfield, Mass.
 C. E. Jennings Co., 101 Reade St., N. Y.
 H. H. Mayhew Co., Shelburne Falls, Mass.
 Nicol & Co., Chicago, Ill.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Snell Mfg. Co., Fliskdale, Mass.
 Springfield Machine Screw Co., Springfield, Mass.
 L. S. Starrett Co., Athol, Mass.
 Storm Mfg. Co., Newark, N. J.
 Tuck Mfg. Co., Brockton, Mass.
 Wheeling Hinge Co., Wheeling, W. Va.

SETS, Rivet—

Braunsdorf-Mueller Co., Elizabeth, N. J.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

SETS, Saw—

E. C. Atkins & Co., Indianapolis, Ind.
 Bemis & Call Hardware & Tool Co., Springfield, Mass.
 Henry Disston & Sons, Philadelphia, Pa.
 Filer & Stowell Co., Milwaukee, Wis.
 Kilborn & Bishop Co., New Haven, Ct.
 P. E. Kohler & Co., Canton, O.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 National Saw Co., Newark, N. J.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Simonds Mfg. Co., Fitchburg, Mass.
 Taintor Mfg. Co., 9-15 Murray St., N. Y.

SETS, Screw Driver and Tool—

Goodell-Pratt Co., Greenfield, Mass.
 Millers Falls Co., 28 Warren St., New York.

SETS, SMOKERS'—See Smokers' Sets.**SETS, Soldering—**

Arcade Mfg. Co., Freeport, Ill.
 W. L. Barrett, Bristol, Ct.
 Millers Falls Co., 28 Warren St., New York.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Stover Mfg. Co., Freeport, Ill.

SETS, Tea, Coffee, Curling, Manicure, Smokers', &c., Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.

SETS, Tool, Hollow Handle—

John S. Fray & Co., Bridgeport, Ct.
 C. E. Jennings Co., 101 Reade St., N. Y.
 Millers Falls Co., 28 Warren St., New York.
 Stanley Rule & Level Co., New Britain, Ct.

SETTEES, LAWN—See Chairs and Settees, Lawn.**SETTERS, Frame or Angle—**

Hilles & Jones Co., Wilmington, Del.

SETTING AND FILING MACHINES, Saw—

Detrick & Harvey Machine Co., Baltimore.

SEWER CASTINGS—See Castings, Man Hole, Cistern Cover, Sewer, Gutter, Crossing, &c.**SEWER GRATINGS—See Gratings, Foundation, Sewer, &c.****SEWER PIPE, TRAPS—See Pipe, Traps.****SEWING BENCHES—See Benches, Sewing.****SEWING MACHINES—**

Chicago Scale Co., Chicago, Ill.
 National Sewing Machine Co., Belvidere, Ill.
 Remington Arms Co., 313 Broadway, N. Y.

SHADE CORD—See Cord, Shade and Ventilator.**SHADE PULLEYS—See Pulleys, Self Adjustable Shade.****SHADE ROLLER BRACKETS AND FIXTURES—See Brackets and Fixtures, Shade Roller.****SHAFT ADJUSTERS, HANGERS, &c.—See Adjusters, Hangers, &c.****SHAFT, Flexible—**

Chicago Flexible Shaft Co., Chicago, Ill.
 Gem Mfg. Co., Pittsburgh, Pa.
 Stow Flexible Shaft Co., Philadelphia, Pa.
 Stow Mfg. Co., Binghamton, N. Y.

SHAFTING—

Allentown Rolling Mills, Allentown, Pa.
 E. P. Allis Co., Milwaukee, Wis.
 American Steel & Wire Co., Chicago, Ill.
 Aultman Co., Canton, O.
 Baker Bros., Toledo, O.
 Bates Machine Co., Joliet, Ill.
 Bethlehem Steel Co., South Bethlehem, Pa.
 Braddock Machine & Mfg. Co., Braddock, Pa.
 Cleveland City Forge & Iron Co., Cleveland, O.
 Geo. V. Cresson Co., Philadelphia, Pa.
 Denman & Davis, 5 Cliff St., New York.
 Dodge Mfg. Co., Mishawaka, Ind.
 Eastern Forge Co., Boston, Mass.
 Fairmount Machine Co., Philadelphia, Pa.
 Fairmount Steel Co., Philadelphia, Pa.
 Farrel Foundry & Mach. Co., Ansonia, Ct.
 Finished Steel Co., Youngstown, O.
 Frankford Steel Co., Ellwood City, Pa.
 Heyl & Patterson, Pittsburgh, Pa.
 Howard Iron Works, Buffalo, N. Y.
 F. W. Iredell, 26 Cortlandt St., New York.
 Jeffrey Mfg. Co., Columbus, O.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Keagy & Lear Machine Co., Coshocton, O.
 Lane & Bodley Co., Cincinnati, O.
 James Leffel & Co., Springfield, O.
 Link-Belt Engineering Co., Philadelphia.
 Machinists' Supply Co., Rochester, N. Y.
 F. R. Patch Mfg. Co., Rutland, Vt.
 Pierson & Co., 29 Broadway, New York.
 Pittsburgh Steel Shafting Co., Pittsburgh, Pa.
 R. Poole & Son Co., Baltimore, Md.
 Republic Iron & Steel Co., Chicago, Ill.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Singer, Nimick & Co., Inc., Pittsburgh, Pa.
 Variety Machine Co., Warsaw, N. Y.
 Edgar T. Ward & Sons, Boston, Mass.
 T. B. Woods' Sons, Chambersburg, Pa.
 S. M. York Co., Cleveland, O.

SHAFTING COLLARS, OILERS—See Collars, Oilers.**SHAFTING, Hollow Seamless Steel—**

Shelby Steel Tube Co., Cleveland, O.

SHAFTING, Polished—

Finished Steel Co., Youngstown, O.

SHAFT LEVELS—See Levels, Shaft.**SHAFTS, Crank—**

Bethlehem Steel Co., South Bethlehem, Pa.
 Cleveland City Forge & Iron Co., Cleveland.
 Eastern Forge Co., Boston, Mass.
 Frankford Steel Co., Ellwood City, Pa.

SHAFT STRAIGHTENING MACHINERY—

Diamond Drill & Machine Co., Birdsboro, Pa.
 Hill, Clarke & Co., Boston, Mass.
 Niles Tool Works Co., Hamilton, O.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Watson-Stillman Co., 204-210 East 43d St., New York.

SHAFT TRIMMINGS, LEATHER—See Trimmings Shaft, Leather.**SHAKER SALTS—See Salts, Shaker.****SHAKERS, Drink—**

Erie Specialty Co., Erie, Pa.

SHAKERS, Stove—

Troy Nickel Works, Albany, N. Y.

SHANKS, Shoe—

Jesse Atherton, Auburn, R. I.
 Diamond Tack & Nail Works, Raynham, Mass.

SHAPERS—

American Tool Works Co., Cincinnati, O.
 U. Baird Machinery Co., Pittsburgh, Pa.
 Barker & Chard Machine Tool Co., Cincinnati, O.
 Baugh & Harris Machine Tool Co., Springfield, Mass.
 Bement, Miles & Co., Philadelphia, Pa.
 Bignall & Keeler Mfg. Co., Edwardsville, Ill.
 Cincinnati Shaper Co., Cincinnati, O.
 Detrick & Harvey Machine Co., Baltimore.
 Fox Machine Co., Grand Rapids, Mich.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Gould & Eberhardt, Newark, N. J.
 Hendey Machine Co., Torrington, Ct.
 Hill, Clarke & Co., Boston, Mass.
 Lucas & Gilem, Philadelphia, Pa.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 Marshall & Hueschart Machinery Co., Chicago, Ill.
 J. J. McCabe, 14 Dey St., New York.
 New Haven Mfg. Co., New Haven, Ct.
 Niles Tool Works Co., Hamilton, O.
 Pedrick & Ayer Co., Philadelphia, Pa.
 Pennsylvania Machinery Co., Pittsburgh, Pa.
 A. B. Pitkin Machinery Co., Providence, R. I.
 Potter & Johnson Co., Pawtucket, R. I.
 Pratt & Whitney Co., Hartford, Ct.
 Prentiss Tool & Supply Co., 115 Liberty St., New York.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Frank Toomey, Philadelphia, Pa.
 S. M. York Co., Cleveland, O.

SHAPERS, Double Head—

Niles Tool Works Co., Hamilton, O.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

SHAPES, Agricultural—

American Steel Hoop Co., Pittsburgh, Pa.
 Illinois Steel Co., Chicago, Ill.
 Jones & Laughlins, Pittsburgh, Pa.
 La Belle Steel Co., Pittsburgh, Pa.
 National Steel Co., Battery Park Building, New York.
 Republic Iron & Steel Co., Chicago, Ill.
 St. Johns Spring Co., St. Johns, Mich.
 Singer, Nimick & Co., Pittsburgh, Pa.
 Star Mfg. Co., Carpentersville, Ill.

SHAPES, Special Rolled Iron—

Chas. G. Eckstein & Co., 249 Center St., New York.
 Pierson & Co., 29 Broadway, New York.
 Wm. H. Wallace & Co., 66 Broadway, N. Y.

SHARPENERS, Dowel—

Stanley Rule & Level Co., New Britain, Ct.

SHARPENERS, Knife—

Millers Falls Co., 28 Warren St., New York.
 Pike Mfg. Co., Pike Station, N. H.
 Star Heel Plate Co., Newark, N. J.
 Tanite Co., Stroudsburg, Pa.

SHARPENERS, Saw—

Diamond Machine Co., Providence, R. I.
 Henry Disston & Sons, Philadelphia, Pa.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Filer & Stowell Co., Milwaukee, Wis.
 Lucas & Gilem, Philadelphia, Pa.
 Wickes Bros., Saginaw, Mich.

SHARPENERS, Skate—

Osborn Mfg. Co., Cleveland, O.
 Samuel Winslow Skate Mfg. Co., Worcester, Mass.

SHAVERS, Beef—See Smoked Beef Cutters.

SHAVERS, Bolt Head—

National Machinery Co., Tiffin, O.

SHAVERS, ICE—See Ice Harvesting Tools.**SHAVES, Ice—**

Arcade Mfg. Co., Freeport, Ill.
Enterprise Mfg. Co., Philadelphia, Pa.
Erie Specialty Co., Erie Pa.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Nicol & Co., Chicago, Ill.
North Bros. Mfg. Co., Philadelphia, Pa.
Stover Mfg. Co., Freeport, Ill.
A. C. Williams, Ravenna, O.

SHAVES, Spoke—

C. E. Jennings Co., 101 Beade St., N. Y.
Millers Falls Co., 28 Warren St., New York.
Stanley Rule & Level Co., New Britain, Ct.
Sam'l C. Tatum Co., Cincinnati, O.

SHAVES, Tobacco—

North Bros. Mfg. Co., Philadelphia, Pa.

SHAVING CUPS, SILVER PLATED—See Cups, Shaving, Silver Plated.**SHAVING MACHINES, Screw—**

American Tool Works Co., Cincinnati, O.

SHEAR BLADES, METAL—See Blades, Metal Shear.**SHEARING MACHINES, Hand—**

Bicknell Hardware Co., Janesville, Wis.
R. E. Kidder, Worcester, Mass.
New Doty Mfg. Co., Janesville, Wis.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.

SHEARS AND SCISSORS—

Acme Shear Co., Bridgeport, Ct.
Bridgeport Mfg. Co., Bridgeport, Ct.
Cattaraugus Cutlery Co., Little Valley, N. Y.
R. Heinisch's Sons Co., Newark, N. J.
National Cutlery Co., Philadelphia, Pa.
Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

SHEARS AND SNIPS, Dental—

National Cutlery Co., Philadelphia, Pa.

SHEARS AND SNIPS, Tinners'—

Acme Shear Co., Bridgeport, Ct.
R. Heinisch's Sons Co., Newark, N. J.
National Cutlery Co., Philadelphia, Pa.
Niagara Machine & Tool Works, Buffalo, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

SHEARS, Barbers'—

Cattaraugus Cutlery Co., Little Valley, N. Y.
R. Heinisch's Sons Co., Newark, N. J.
National Cutlery Co., Philadelphia, Pa.

SHEARS, Beam and Channel—

Hilles & Jones Co., Wilmington, Del.
Long & Allstatter Co., Hamilton, O.
New Doty Mfg. Co., Janesville, Wis.
Niles Tool Works Co., Hamilton, O.
Royersford Foundry & Machine Co., Royersford, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.

SHEARS, Beveling—

Hilles & Jones Co., Wilmington, Del.
Long & Allstatter Co., Hamilton, O.
New Doty Mfg. Co., Janesville, Wis.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

SHEARS, Candy—

R. Heinisch's Sons Co., Newark, N. J.

SHEARS, Circular—

Gould & Eberhardt, Newark, N. J.

SHEARS, Fruit and Flower Gathering—

N. R. Streeter & Co., Rochester, N. Y.

SHEARS, Garden—

Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

SHEARS, Glass—

R. Heinisch's Sons Co., Newark, N. J.

SHEAR SHARPENERS—See Sharpeners, Shear.**SHEARS, Hydraulic—**

Henry Alken, Pittsburgh, Pa.
Frank-Kneeland Machine Co., Pittsburgh.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.
R. D. Wood & Co., Philadelphia, Pa.

SHEARS, Lawn or Grass—

Clark & Parsons Co., Wilton, Maine.

SHEARS, Metal—

Henry Alken, Pittsburgh, Pa.
Bement, Miles & Co., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Bicknell Hardware Co., Janesville, Wis.
E. W. Bliss Co., Brooklyn, N. Y.
Lloyd Booth Co., Youngstown, O.
Buffalo Forge Co., Buffalo, N. Y.
Chandler & Farquhar, Boston, Mass.
Danielson Machine & Tool Co., Cleveland, O.
G. T. Eames Co., Kalamazoo, Mich.
Chas. G. Eckstein & Co., 349 Centre St., New York.
Farrel Foundry & Mach. Co., Ansonia, Ct.
Frank-Kneeland Machine Co., Pittsburgh.
Fulton Iron & Engine Co., Detroit, Mich.
Gould & Eberhardt, Newark, N. J.
Hill, Clarke & Co., Boston, Mass.
Hilles & Jones Co., Wilmington, Del.
R. E. Kidder, Worcester, Mass.
Long & Allstatter Co., Hamilton, O.
Manning, Maxwell & Moore, 85 Liberty St., New York.

J. J. McCabe, 14 Dey St., New York.

A. H. Merriman, Meriden, Ct.

C. S. Mersick & Co. New Haven, Ct.

Mesta Machine Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester, Mass.

National Machinery Co., Tiffin, O.

New Doty Mfg. Co., Janesville, O.

Niagara Machine & Tool Works, Buffalo, N. Y.

Niles Tool Works Co., Hamilton, O.

Philadelphia Machine Tool Co., Philadelphia, Pa.

Philadelphia Roll & Machine Co., Philadelphia, Pa.

F. R. Phillips' Sons, Philadelphia, Pa.

A. B. Pitkin Machinery Co., Providence, R. I.

Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.

Prentiss Tool & Supply Co., 115 Liberty St., New York.

Royersford Foundry & Machine Co., Royersford, Pa.

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

Smith & Egge Mfg. Co., Bridgeport, Ct.

Frank Toomey, Philadelphia, Pa.

Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.

Wals & Roos Punch & Shear Co., Cincinnati, O.

Watson-Stillman Co., 204-210 East 43d St., New York.

Whitcomb Mfg. Co., Worcester, Mass.

Wickes Bros., Saginaw, Mich.

Williams, White & Co., Moline, Ill.

R. D. Wood & Co., Philadelphia, Pa.

W. C. Young Mfg. Co., Worcester, Mass.

SHEARS, Paper Hangers'—

Cattaraugus Cutlery Co., Little Valley, N. Y.

R. Heinisch's Sons Co., Newark, N. J.

National Cutlery Co., Philadelphia, Pa.

SHEARS, Pruning—

J. T. Henry Mfg. Co., Hamden, Ct.
F. E. Kohler & Co., Canton, O.
Fred. J. Meyers Mfg. Co., Hamilton, O.
New England Specialty Co., North Easton, Mass.

SHEARS, Rotary—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
E. W. Bliss Co., Brooklyn, N. Y.
Detrick & Harvey Machine Co., Baltimore.
Hilles & Jones Co., Wilmington, Del.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niagara Machine & Tool Works, Buffalo, N. Y.
F. R. Phillips' Sons, Philadelphia, Pa.
Watson-Stillman Co., 204-210 East 43d St., New York.

SHEARS, Rubber and Leather—

National Cutlery Co., Philadelphia, Pa.

SHEARS, Sheep—

Wiebusch & Hilger, Ltd., 9-15 Murray St., New York.

SHEARS, Tailors'—

R. Heinisch's Sons Co., Newark, N. J.

SHEAR STEEL, DOUBLE—See Steel, Double Shear.**SHEARS, Wire—**

J. M. King & Co., Waterford, Ct.

SHEATHING, Copper—

Hendricks Bros., 49 Cliff St., New York.

SHEATHING NAILS, &c., Yellow Metal—

U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Randolph-Clowes Co., Waterbury, Ct.

SHEATHING PAPER—See Paper, Sheathing.**SHEAVES, Door—**

Griffin Mfg. Co., Allegheny, Pa.
John C. Kupferle, St. Louis, Mo.
Nicol & Co., Chicago, Ill.
Norwalk Lock Co., South Norwalk Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
I. S. Spencer's Sons, Chicopee Falls, Mass.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wrightsville Hardware Co., Wrightsville, Pa.

SHEAVES, Hoisting—

A. Leschen & Sons Rope Co., St. Louis, Mo.

SHEAVES, Power Transmission—

Aultman Co., Canton, O.
Thos. Carlin's Sons, Allegheny, Pa.
Geo. V. Cresson Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Machine Co., Philadelphia, Pa.
Heyl & Patterson, Pittsburgh, Pa.
F. W. Iredell, 26 Cortlandt St., New York.
Jeffrey Mfg. Co., Columbus, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Link-Belt Engineering Co., Philadelphia.
Henry B. Newhall, 26 Cortlandt St., N. Y.
Robert Poole & Sons Co., Baltimore, Md.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Trenton Iron Co., Trenton, N. J.
T. B. Woods' Sons, Chambersburg, Pa.

SHEAVES, Shutter—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

SHEAVES, Tackle Block—

Boston & Lockport Block Co., Boston.
Cleveland Block Co., Cleveland, O.
W. & J. Tiebout, 118 Chambers St., N. Y.
Union Hardware Co., Torrington Ct.

SHEAVES, Wood Split—

Dodge Mfg. Co., Mishawaka, Ind.
Saginaw Mfg. Co., Saginaw, Mich.

SHEEP BELLS, SHEARS—See Bells, Shears.**SHEEP SHEARING MACHINE—**

American Shearer Mfg. Co., Nashua, N. H.
Chicago Flexible Shaft Co., Chicago, Ill.
Sigourney Tool Co., Hartford, Ct.

SHEET AND ROLL BRASS—See Brass, Roll and Sheet.**SHEET AND ROLL BRONZE—See Bronze, Roll and Sheet.****SHEET BARS—See Bars, Sheet and Tin Plate.****SHEET COPPER—See Copper, Roll and Sheet.****SHEET CORRUGATING MACHINERY—**

Frank-Kneeland Machine Co., Pittsburgh.

SHEET GUIDES—See Guides, Sheet and Rope.**SHEET IRON, Cold Rolled—**

Republic Iron & Steel Co., Chicago, Ill.
W. Dewees Wood Co., McKeesport, Pa.

SHEET IRON DOOR CAPS—See Caps, Door and Window, Sheet Iron.**SHEET IRON FINIALS—See Finials and Vanes, Sheet Iron.**

SHEET IRON, Planished—

W. Dewees Wood Co., McKeesport, Pa.

SHEET IRON WARE—See Ware, Sheet Iron.**SHEET IRON WORK—**Drouve Co., Bridgeport, Ct.
Robert Wetherill & Co., Chester, Pa.**SHEET LEAD—**

E. Phillips & Sons, South Hanover, Mass.

SHEET METAL, Blanked and Formed—See Stamping, Sheet Metal.**SHEET METAL DIES, GAUGES—See Dies, Gauges.****SHEET METAL GOODS, to order—**W. J. Clark Co., Salem, O.
Clark & Cowles, Plainville, Ct.
Goodwin & Kintz Co., Winsted, Ct.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Taplin Mfg. Co., Forestville, Pa.**SHEET METAL WORK—**W. J. Clark Co., Salem, O.
Wm. B. Scaife & Sons, Pittsburgh, Pa.**SHEET METAL WORK, ORNAMENTAL—See Metal Work, Ornamental Sheet.****SHEET METAL WORK, TO ORDER—See Metal Work, Milled, Turned or Stamped, to order.****SHEET MILL DOUBLERS—See Doublers, Sheet Mill.****SHEET RUBBER, Vulcanized—**Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.**SHEETS, Aluminum—**Pittsburgh Reduction Co., Pittsburgh, Pa.
Scovill Mfg. Co., Waterbury, Ct.**SHEETS, Brass—See Brass, Roll and Sheet.****SHEETS, Corrugating Machinery—**

Niagara Machine & Tool Works, Buffalo, N. Y.

SHEETS, Galley—

Ansonia Brass & Copper Co., 19 Cliff St., New York.

SHEETS, Galvanized—American Sheet Steel Co., Battery Park Building, New York.
Garry Iron & Steel Roofing Co., Cleveland, O.
John B. Newkirk & Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Republic Iron & Steel Co., Chicago, Ill.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
E. H. Stroud & Co., Chicago, Ill.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
Youngstown Iron & Steel Roofing Co., Youngstown, O.**SHEETS, Iron and Steel—**American Sheet Steel Co., Battery Park Building, New York.
American Steel & Wire Co., Chicago, Ill.
American Tin Plate Co., Battery Park Building, New York.
Champion Iron & Steel Co., Muskegon, Mich.
Coshocton Rolling Mill Co., Coshocton, O.
Justice Cox, Jr., Philadelphia, Pa.
Crescent Steel Co., Pittsburgh, Pa.
Denman & Davis, 85 and 87 John St., N. Y.
J. W. Hoffman & Co., Philadelphia, Pa.
William Jessop & Sons, 91 John St., N. Y.
Kanneberg Roofing Co., Canton, O.
Henry Levis & Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Horace T. Potts & Co., Philadelphia, Pa.
Railway Supply Co., St. Louis, Mo.
Republic Iron & Steel Co., Chicago, Ill.
Wm. & Henry Rowland, Philadelphia, Pa.
E. H. Stroud & Co., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
S. & C. Wardlow, 95 John St., New York.
Wilmoit & Hobbs Mfg. Co., Bridgeport, Ct.
Alan Wood Co., Philadelphia, Pa.
W. Dewees Wood Co., McKeesport, Pa.
Youngstown Iron & Steel Roofing Co., Youngstown, O.**SHEETS, Polished Steel—**American Sheet Steel Co., Battery Park Building, New York.
American Tin Plate Co., Battery Park Building, New York.**SHEETS, Range—**American Sheet Steel Co., Battery Park Building, New York.
American Tin Plate Co., Battery Park Building, New York.**SHEETS, Roofing—**American Sheet Steel Co., Battery Park Building, New York.
Wm. B. Scaife & Sons, Pittsburgh, Pa.**SHEETS, Stove Body—**American Sheet Steel Co., Battery Park Building, New York.
American Tin Plate Co., Chicago, Ill.**SHEET STEEL, Cold Rolled—**American Tin Plate Co., Battery Park Building, New York.
Denman & Davis, 85 and 87 John St., N. Y.
Garry Iron & Steel Roofing Co., Cleveland, O.
Wm. Jessop & Sons, 91 John St., N. Y.
Jonas & Colver Continental Steel Works, 101 Duane St., New York.
Singer, Nimick & Co., Pittsburgh, Pa.
S. & C. Wardlow, 95 John St., New York.
Wilmoit & Hobbs Mfg. Co., Bridgeport, Ct.**SHEET STEEL, Hot Rolled—**American Sheet Steel Co., Battery Park Building, New York.
Garry Iron & Steel Roofing Co., Cleveland, O.
Wm. Jessop & Sons, 91 John St., New York.
Jonas & Colver Continental Steel Works, 101 Duane St., New York.
F. R. Phillips' Sons Co., Philadelphia, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
S. & C. Wardlow, 95 John St., New York.**SHELF BOXES, BRACKETS, PINS, RESTS, SUPPORTS—See Boxes, Brackets, Pins, Rests, Supports.****SHELLERS, Corn—**Janesville Hay Tool Co., Janesville, Wis.
Orangeville Agricultural Works & Foundry, Orangeville, Pa.
Stover Mfg. Co., Freeport, Ill.
R. W. Whitehurst & Co., Norfolk, Va.
J. K. Wilder & Sons, Monroe, Mich.**SHELLS, Brass, Seamless—**

Randolph-Clowes Co., Waterbury, Ct.

SHELLS, Brass Shot—Union Metallic Cartridge Co., 313-315 Broadway, New York.
Waterbury Brass Co., Waterbury, Ct.**SHELLS, Copper, Seamless—**

Randolph-Clowes Co., Waterbury, Ct.

SHELLS, Paper, Loaded—Peters Cartridge Co., Cincinnati, O.
Union Metallic Cartridge Co., 313-315 Broadway, New York.**SHELLS, Paper Shot—**Peters Cartridge Co., Cincinnati, O.
Union Metallic Cartridge Co., 313-315 Broadway, New York.
Waterbury Brass Co., Waterbury, Ct.**SHELLS, Roll—**

Chrome Steel Works, Brooklyn, N. Y.

SHELVES, STOVE PIPE, IRON—

Adams Co., Dubuque, Ia.

SHELVES, STOVE PIPE, WIRE—See Household Articles, Wire.**SHELVING, Hardware Store—**

J. D. Warren Mfg. Co., Chicago, Ill.

SHEPHERDS' CROOKS—See Crooks, Shepherds'.**SHINGLE AND HEADING MACHINES—See Heading and Shingle Machines.****SHINGLES, Metallic—**Garry Iron & Steel Roofing Co., Cleveland, O.
Merchant & Co., Philadelphia, Pa.
Penn Metal Ceiling & Roofing Co., Philadelphia, Pa.**SHINGLING HATCHETS—See Hatchets, Shingling, Half, &c.****SHIP ANCHORS, PUMPS—See Anchors, Pumps.****SHIPBUILDERS—**Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, New York.**SHIP CARPENTERS' TOOLS—See Tools, Ship Carpenters'.****SHIP CHANDLERY HARDWARE—**Boston & Lockport Block Co., Boston.
Edson Mfg. Co., Boston, Mass.
W. & J. Tiebout, 118 Chambers St., N. Y.**SHIP LOCKS AND LATCHES—See Locks and Latches.****SHIPYARD MACHINERY—**Bement, Miles & Co., Philadelphia, Pa.
Brown Hoisting & Conveying Machine Co., Cleveland, O.
Detrick & Harvey Machine Co., Baltimore.
Hilles & Jones Co., Wilmington, Del.
Niles Tool Works Co., Hamilton, O.
Wickes Bros., Saginaw, Mich.**SHODDY MACHINERY—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

SHOE BLACKING, BRUSHES, &c.—See Blacking, Brushes, &c.**SHOE HORNS—See Horns, Silver Plated.****SHOE NAIL MACHINES—See Nail Machines, Shoe.****SHOES, Brake—**Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Sessions Foundry Co., Bristol, Ct.**SHOES, Horse and Mule—**American Steel & Wire Co., Chicago, Ill.
Burden Iron Co., Troy, N. Y.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence, R. I.
Virginia Iron, Coal & Coke Co., Bristol, Pa.**SHOES, Ox—**Atwater Mfg. Co., Southington, Ct.
Millers Falls Co., 28 Warren St., New York.
Scranton Forging Co., Scranton, Pa.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.**SHOES, Pile—**

Janney, Steinmetz & Co., Philadelphia, Pa.

SHOES, Sleigh—John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.**SHOES, Wagon Lock—**John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.**SHOP LOCKERS—See Lockers.****SHOP PANS—See Pans, Shop.****SHOT—**

Markle Lead Works, St. Louis, Mo.

SHOT GUNS, POUCHES, SPREADERS—See Guns, Pouches, Spreaders.**SHOULDER HOOKS—See Hooks, Cup and Shoulder.****SHOVEL AND SPADE D-HANDLE TOPS—See Tops, D-Handle.****SHOVEL BRACKETS, HANDLES, SCRAPERS—See Brackets, Handles, Scrapers.****SHOVELS AND SCOOPS, Furnace—**

F. E. Kohler & Co., Canton, O.

SHOVELS AND SPADES—Avery Stamping Co., Cleveland, O.
Havana Metal Wheel Co., Havana, Ill.
New Castle Shovel Co., New Castle, Pa.
St. Louis Shovel Co., St. Louis, Mo.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.**SHOVELS, Brass and Bronze—**

Phosphor-Bronze Smelting Co., Philadelphia, Pa.

SHOVELS, Ore—

Thew Automatic Shovel Co., Lorain, O.

SHOVELS, Snow—

Avery Stamping Co., Cleveland, O.
F. E. Kohler & Co., Canton, O.

SHOVELS, Steam—

C. W. Hunt Co., West New Brighton, N. Y.
Vulcan Iron Works, Chicago, Ill.

SHOVELS, Stove—

W. J. Clark Co., Salem, O.
Keen & Hagerty Mfg. Co., Baltimore, Md.
New York Stamping Co., Brooklyn, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Sidney Shepard & Co., Buffalo, N. Y.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Albany, N. Y.
Wheeling Hinge Co., Wheeling, W. Va.

SHOVELS, Tiling or Ditching—

St. Louis Shovel Co., St. Louis, Mo.
Terre Haute Shovel & Tool Co., Terre Haute, Ind.

SHOVELS, TONGS, POKERS, FIRE SETS, &c.—

Logan & Strobbridge Iron Co., New Brighton, Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Stover Mfg. Co., Freeport, Ill.
Troy Nickel Works, Albany, N. Y.
Wheeling Hinge Co., Wheeling, W. Va.

SHOVELS, Wood—

John Sommer's Son, Newark, N. J.

SHOWCASE CATCHES, SUPPORTS—See Catches, Supports.**SHREDDERS, Dry Fodder—**

Silver Mfg. Co., Salem, O.
J. K. Wilder & Sons, Monroe, Mich.

SHREDDERS, Vegetable—

Henry Disston & Sons, Philadelphia, Pa.

SHRINKERS, Tire—

Champion Blower & Forge Co., Lancaster, Pa.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

SHUFFLE BOARDS—See Boards, Shuffle.**SHUTES, Coal—See Chutes, Coal.****SHUTTER BARS, BOLTS, &c.—See Bars, Bolts, &c.****SHUTTERS, IRON AND STEEL—See Doors and Shutters, Iron and Steel.****SICKLES—See Hooks, Grass.****SIDE PULLEYS—See Pulleys, Side.****SIDE RODS—**

Eastern Forge Co., Boston, Mass.

SIDEWALK CLEANERS, HOISTS—See Cleaners, Hoists.**SIDEWALK FOUNDATIONS—**

Youngstown Iron & Steel Roofing Co., Youngstown, O.

SIDING, IRON AND STEEL—See Ceiling and Siding, Iron and Steel.**SIEVES—See Riddles and Sieves.****SIEVES, Ash—**

Wickwire Bros., Cortland, N. Y.

SIEVES, Flour—

Estey Wire Works Co., 65 Fulton St., N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff St.,
Fred. J. Meyers Mfg. Co., Hamilton, O.
Sidney Shepard & Co., Buffalo, N. Y.

SIFTERS, Ash—

J. R. Clark Co., Minneapolis, Minn.
Edward Darby & Sons, Philadelphia, Pa.
Hill Dryer Co., Worcester, Mass.
N. R. Streeter & Co., Rochester, N. Y.
W. S. Tyler Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

SIFTERS, Flour—

Edward Darby & Sons, Philadelphia, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Sidney Shepard & Co., Buffalo, N. Y.

SIFTERS, Sand—

Byram & Co., Detroit, Mich.
J. Gilmour, Bennett Building, New York.
Gould & Eberhardt, Newark, N. J.
Northern Engineering Works, Detroit, Mich.
J. W. Paxson Co., Philadelphia, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.

SIGNAL BELLS, CORD, LAMPS—See Bells, Cord, Lamps.**SIGNALS, Railroad—**

Allentown Rolling Mills, Allentown, Pa.

SIGNALS, Railroad, Enameled—

Baltimore Enamel Co., Baltimore, Md.

SIGN LETTERS—See Letters, Cast Iron Sign.**SIGN OR ENGRAVERS' BRASS—See Brass, Sign or Engravers'.****SIGNS, Enameled—**

Baltimore Enamel Co., Baltimore, Md.

SIGNS, Wire, &c.—

E. T. Barnum, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
New England Structural Co., Boston, Mass.
Up-to-Date Mfg. Co., Terre Haute, Ind.

SILICON, Carbide of—

Carborundum Co., Niagara Falls, N. Y.

SILICO-SPIEGEL—

Geo. G. Blackwell, Sons & Co., Liverpool, England.

SILVER, GERMAN—See German Silver.**SILVER PLATED BRUSHES—See Brushes, Silver Plated.****SILVER SOLDER, TUBING—See Solder, Tubing.****SINGLE TREE HOOKS—See Hooks, Single Tree, Safety.****SINK BOLTS, CLEANERS, STRAINERS—See Bolts, Cleaners, Strainers.****SINKS, Cast—**

Barnes Mfg. Co., Mansfield, O.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Humphries Mfg. Co., Mansfield, O.

SINKS, Wrought Iron—

V. Clad & Sons, Philadelphia, Pa.

SINKS, Wrought Steel—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

SKATES, Ice—

Union Hardware Co., Torrington, Ct.
Samuel Winslow Skate Mfg. Co., Worcester, Mass.

SKATES, Roller—

National Sewing Machine Co., Belvidere, Ill.
Richard Mfg. Co., Bloomsburg, Pa.
Union Hardware Co., Torrington, Ct.
Samuel Winslow Skate Mfg. Co., Worcester, Mass.

SKEINS, Thimble, and Boxes—

A. C. Williams, Ravenna, O.

SKELP, Iron and Steel—

American Steel Hoop Co., Pittsburgh, Pa.
Danville Bessemer Co., Danville, Pa.

SKIDS—

Boston & Lockport Block Co., Boston.
Fairbanks Co., 311 Broadway, New York.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Lansing Wheelbarrow Co., Lansing, Mich.

SKILLETS, COPPER—See Ware, Copper.**SKIMMERS—See Kitchen Articles, Wire.****SKYLIGHTS, Sheet Iron—**

G. Drouve Co., Bridgeport, Ct.
Garry Iron & Steel Roofing Co., Cleveland, O.
Kanneberg Roofing Co., Canton, O.

SKYLIGHT WINDOW OPENERS—

E. A. Ormsby, Melrose, Mass.

SLATERS' TOOLS—See Tools, Slaters'.**SLATE SAWS—See Saws, Slate.****SLATS, Louver—**

Youngstown Iron & Steel Roofing Co., Youngstown, O.

SLAW CUTTERS—See Cutters, Slaw.**SLEDGES—See Hammers, Heavy, and Sledges.****SLEDGES AND HAMMERS—**

Heller Bros. Co., Newark, N. J.
Van Wagoner & Williams Hardware Co., Cleveland, O.

SLEDS, Bob—

Orangeville Agricultural Works & Foundry, Orangeville, Pa.

SLEDS, Skate—

Avery Stamping Co., Cleveland, O.

SLEIGH BELLS, PLUMES, SHOES—See Bells, Plumes, Shoes.**SLEIGH BELL STRAPS—See Straps, Sleigh Bell.****SLEIGH SHOE BOLTS—See Bolts, Sleigh Shoe.****SLICERS, Ear Corn—**

Sandwich Enterprise Co., Sandwich, Ill.

SLICERS, Vegetable and Fruit—

Enterprise Mfg. Co., Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
N. R. Streeter & Co., Rochester, N. Y.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

SLICKS, Carpenters'—

Buck Bros., Milbury, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
L. & I. J. White Co., Buffalo, N. Y.

SLIDES, Desk—

Stanley Works, New Britain, Ct.

SLIDES, ROPE—See Clamps and Slides, Rope.**SLING CHAINS—See Chains, Sling.****SLINGS, Hay—See Haying Tools.****SLITTING MACHINES—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
E. W. Bliss Co., Brooklyn, N. Y.
Cross & Speirs Machine Co., Waterbury, Ct.
Danielson Machine & Tool Co., Cleveland, O.
Kimball Bros. & Sprague, Brockton, Mass.
Long & Allstatter Co., Hamilton, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Willmot & Hobbs Mfg. Co., Bridgeport, Ct.

SLITTING SAWS—See Saws, Slitting.**SLOTTED HEAD BOLTS—See Bolts, Special.****SLOTING AND SLABBING MACHINES, Bicycle Nipple—**

Garvin Machine Co., Spring & Varick Sts., New York.
E. J. Manville Machine Co., Waterbury, Ct.

SLOTING MACHINES—

Bement, Miles & Co., Philadelphia, Pa.
Garvin Machine Co., Spring & Varick Sts., New York.
Hill, Clarke & Co., Boston, Mass.
Lucas & Gilem, Philadelphia, Pa.
New Haven Mfg. Co., New Haven, Ct.
Niles Tool Works Co., Hamilton, O.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

SLOTING MACHINES, Locomotive Frame—

Niles Tool Works Co., Hamilton, O.

SLOTING MACHINES, Screw Head—

American Tool Works Co., Cincinnati, O.
Garvin Machine Co., Spring & Varick Sts., New York.
Harvey Hubbell, Bridgeport, Ct.
E. J. Manville Machine Co., Waterbury, Ct.
Pratt & Whitney Co., Hartford, Ct.

SMOKERS' SETS, Aluminum—

Scovill Mfg. Co., Waterbury, Ct.

SMOKERS' SETS, Silver Plated—

S. F. Myers Co., 48-50 Maiden Lane, N. Y.

SMOKESTACK BREECHING—See Breeching, Smokestack.**SMOKESTACKS—See Chimney, Steel.****SNAP GAUGES, GAUGE BLANKS—See Gauges, Blanks.****SNAPS AND SWIVELS, Halter, Harness, &c.—**

Onelda Community, Niagara Falls, N. Y.

SNAPS, Halter, Harness, &c.—

Billings & Spencer Co., Hartford, Ct.
 Bridgeport Chain Co., Bridgeport, Ct.
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Works Farmer, N. Y.
 W. & E. T. Fitch Co., New Haven, Ct.
 Imperial Bit & Snap Co., Racine, Wis.

SNATCH BLOCKS—See Blocks, Deck and Snatch.**SNATHS—**

Iowa Farming Tool Co., Fort Madison, Ia.
 Withington & Cooley Mfg. Co., Jackson, Mich.

SNIFTING VALVES—See Valves, Snifting.**SNIPS, Cotton Bale—**

Peck, Stow & Wilcox Co., 27 Murray St., New York.

SNIPS, Tanners'—See Shears and Snips, Tanners'.**SNOW SHOVELS—See Shovels, Snow.****SOAP BOXES, SILVER PLATED—See Boxes, Soap, Silver Plated.****SOAP DISHES, TRAYS—See Dishes, Trays.****SOAPSTONE GRIDDLES—See Griddles, Soapstone.****SOCKET BOLTS, HOOKS, WRENCHES—See Bolts, Hooks, Wrenches.****SOCKET BUSHINGS AND HOOKS, ELECTRIC—See Electric Light Fittings.****SOCKETS AND STANDARDS, CANOPY TOP—See Standards and Sockets, Canopy Top.****SOCKETS, Drill—**

Billings & Spencer Co., Hartford, Ct.
 Cleveland Twist Drill Co., Cleveland, O.
 Imperial Bit & Snap Co., Racine, Wis.
 Morse Twist Drill & Machine Co., New Bedford, Mass.
 New Process Twist Drill Co., Taunton, Mass.
 Onelda Community, Niagara Falls, N. Y.
 Standard Tool Co., Cleveland, O.
 Stow Flexible Shaft Co., Philadelphia, Pa.

SOCKETS, Flag Pole—

W. & J. Tiebout, 118 Chambers St., N. Y.

SOCKETS, SHAFT, YOKE, POLE AND WHIFFLETREE—See Tips or Sockets, Shaft, Yoke, Pole and Whiffletree.**SOCKETS, Whip—**

W. & E. T. Fitch Co., New Haven, Ct.
 Imperial Bit & Snap Co., Racine, Wis.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

SODA TANKS—See Tanks, Gas, Air, Soda, &c.**SODA WATER SPOONS—See Spoons, Soda, Silver Plated.****SOFAS, OFFICE—See Couches and Sofas, Office.****SOLDER—**

Garry Iron & Steel Roofing Co., Cleveland, O.
 Theo. Hertz & Son, St. Louis, Mo.
 Markle Lead Works, St. Louis, Mo.
 Merchant & Co., Philadelphia, Pa.
 Charles Millar & Son, Utica, N. Y.
 J. J. Ryan & Co., Chicago, Ill.

SOLDER, Braziers'—

U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
 Scovill Mfg. Co., Waterbury, Ct.

SOLDERING COPPER HANDLES—See Handles, Soldering, Copper.**SOLDERING COPPERS, SETS—See Coppers, Sets.****SOLDERING FURNACES—See Furnaces, Soldering.****SOLDERING MACHINES—**

E. W. Bliss Co., Brooklyn, N. Y.

SOLDER, Silver—

U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.

SOLID BOX VISES—See Vises, Solid Box.**SOLID METAL SPOONS AND FORKS—See Spoons and Forks, Solid Metal.****SOLING, Rubber—**

Boston Belting Co., Boston, Mass.

SORTERS, Potato—

Aspinwall Mfg. Co., Jackson, Mich.

SOUNDING LEADS—See Leads, Sounding.**SOWERS, Seed—**

Goodell Co., Antrim, N. H.

SPACING TABLES—

Hilles & Jones Co., Wilmington, Del.

SPACING TABLES, Automatic—

Long & Allstatter Co., Hamilton, O.

SPADE HANDLES—See Handles, Fork, Spade, &c.**SPADES—See Shovels and Spades.****SPADES, POST HOLE—See Post Hole Spades.****SPADING FORKS—See Forks, Hay, Manure, Spading, &c.****SPAN WIRE—See Wires, Electrical.****SPARK ARRESTERS—See Arresters, Spark.****SPARK COILS—See Coils, Electric Spark.****SPATULAS—**

American Cutlery Co., Chicago, Ill.

SPEAKING TUBE HARDWARE—

W. R. Ostrander & Co., 22 Dey St., N. Y.
 Reading Hardware Co., Reading, Pa.

SPEAKING TUBES—See Tubes, Speaking.**SPEARS, Fish—**

Arcade Mfg. Co., Freeport, Ill.

SPECIAL MACHINERY—

Adriance Machine Works, Brooklyn, N. Y.
 American Machinery Co., Grand Rapids, Mich.
 Automatic Machine Co., Bridgeport, Ct.
 Bement, Miles & Co., Philadelphia, Pa.
 E. W. Bliss Co., Brooklyn, N. Y.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 J. B. Chapman & Co., Springfield, Mass.
 Asa S. Cook Co., Hartford, Ct.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 J. E. Costello Mach. Works, Brooklyn, N. Y.
 D'Armour & Littleale Machine Co., 129 Worth St., New York.
 W. P. Davis Machine Co., Rochester, N. Y.
 Detrick & Harvey Machine Co., Baltimore.
 Diamond Drill & Machine Co., Birdsboro, Pa.
 H. C. Fish Machine Works, Worcester, Mass.
 Frank-Kneeland Machine Co., Pittsburgh.
 Garvin Machine Co., Spring & Varick Sts., New York.
 Geometric Drill Co., New Haven, Ct.
 Gould & Eberhardt, Newark, N. J.
 E. Harrington, Son & Co., Philadelphia, Pa.
 W. H. Hibbard, Brooklyn, N. Y.
 Hoefer Mfg. Co., Freeport, Ill.
 Hoggson & Pettis Mfg. Co., New Haven, Ct.
 I. H. Johnson, Jr., & Co., Philadelphia, Pa.
 Keagy & Lear Machine Co., Coshocton, O.
 R. E. Kidder, Worcester, Mass.
 E. Konigelow & Bro., Cleveland, O.
 Chas. E. Leffler & Co., Brooklyn, N. Y.
 John Loyd, 558 Water St., New York.
 P. Hollingsworth Morris, Philadelphia, Pa.

Frank Mossberg Co., Attleboro, Mass.
 Nazel & Bassett, Philadelphia, Pa.
 Niles Tool Works Co., Hamilton, O.
 A. H. Nilson Machine Co., Bridgeport, Ct.
 Norwood Bicycle Co., Cincinnati, O.
 R. D. Nuttall Co., Allegheny, Pa.
 Philadelphia Machine Tool Co., Philadelphia, Pa.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
 Robert Poole & Son Co., Baltimore, Md.
 Pratt & Whitney Co., Hartford, Ct.
 Richard Mfg. Co., Bloomsburg, Pa.
 Royersford Foundry & Machine Co., Royersford, Pa.
 Rudolph & Krummel, Chicago, Ill.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 F. B. Shuster Co., New Haven, Ct.
 Sigourney Tool Co., Hartford, Ct.
 Taunton Locomotive Mfg. Co., Taunton, Mass.
 Variety Machine Co., Warsaw, N. Y.
 Washburn Shops, Worcester, Mass.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
 Webster & Perks Tool Co., Springfield, O.
 W. A. Wilson, Rochester, N. Y.
 Windsor Machine Co., Windsor, Vt.

SPECIAL SCREWS, WIRE—See Screws, Wire.**SPECIALTIES TO ORDER, METAL—See Metal Specialties to Order.****SPECIALTIES, TURNED METAL—See Turned Metal Work.****SPECIALTIES, WOODEN—See Wooden Specialties.****SPELTER—**

American Metal Co., 52 Broadway, N. Y.
 John Davol & Sons, 100 John St., N. Y.
 Hendricks Bros., 49 Cliff St., New York.
 Theo. Hertz & Son, St. Louis, Mo.
 Illinois Zinc Co., Peru, Ill.
 Lewisohn Bros., 81 & 83 Fulton St., N. Y.
 Matthiessen & Hegeier Zinc Co., La Salle, Ill.
 Merchant & Co., Philadelphia, Pa.
 Pennsylvania Smelting Co., Pittsburgh, Pa.
 Arthur T. Rutter, 256 Broadway, N. Y.
 J. J. Ryan & Co., Chicago, Ill.
 H. M. Shimer & Co., Philadelphia, Pa.
 E. H. Stroud & Co., Chicago, Ill.

SPELTER, BRAZING—See Brass, Brazing.**SPICE CANS, MILLS—See Cans, Mills.****SPICING CHUCKS—See Chucks, Spicing.****SPIKE MACHINERY—**

National Machinery Co., Tiffin, O.
 Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.

SPIKES, Boat—

American Iron & Steel Mfg. Co., Lebanon, Pa.
 American Steel & Wire Co., Chicago, Ill.

SPIKES, Dock, Wharf, &c.—

American Iron & Steel Mfg. Co., Lebanon, Pa.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Pierson & Co., 29 Broadway, New York.
 Republic Iron & Steel Co., Chicago, Ill.

SPIKES, Marlin, Pickers, &c.—

W. & J. Tiebout, 118 Chambers St., N. Y.

SPIKES, Railroad—

American Iron & Steel Mfg. Co., Lebanon, Pa.
 American Steel & Wire Co., Chicago, Ill.
 Illinois Steel Co., Chicago, Ill.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Pierson & Co., 29 Broadway, New York.
 Republic Iron & Steel Co., Chicago, Ill.

SPINDLE IRON—See Iron, Spindle.**SPINDLES, Carriage Seat—**

W. R. Hartigan, Collinsville, Ct.

SPINDLES, Lathe—

Frankford Steel Co., Ellwood City, Pa.
 Shelby Steel Tube Co., Cleveland, O.

SPINNING, Metal—

Goodwin & Klerz Co., Winsted, Ct.

SPLICERS, Wire—

American Steel & Wire Co., Chicago, Ill.
 Metropolitan Daylight Lamp Co., Chicago, Ill.
 Utica Drop Forge & Tool Co., Utica, N. Y.

SPlicing CLAMPS—See Clamps, Splicing.**SPOKE EXTRACTORS, POINTERS, SHAVES, TRIMMERS—See Extractors, Pointers, Shaves, Trimmers.****SPOKE HEADER AND BENDER, Bicycle—**

Garvin Machine Co., Spring & Varick Sts., New York.
E. J. Manville Machine Co., Waterbury, Ct.
Rudolph & Krummel, Chicago, Ill.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

SPOKES, Automobile—

Excelsior Needle Co., Torrington, Ct.
Wire Goods Co., Worcester, Mass.

SPOKES, Bicycle—

American Steel & Wire Co., Chicago, Ill.
Excelsior Needle Co., Torrington, Ct.
Reading Screw Co., Norristown, Pa.
Wire Goods Co., Worcester, Mass.

SPOKE TENON MACHINES—

Defiance Machine Works, Defiance, O.
Silver Mfg. Co., Salem, O.

SPOKE THREADERS, BICYCLE—See Threaders, Bicycle Spoke.**SPOKE, WHEEL AND HANDLE MACHINERY—**

Egan Co., Cincinnati, O.

SPOKE WIRE, BICYCLE—See Wire, Bicycle Spoke.**SPONGE BASKETS—See Baskets, Sponge.****SPOOLED WIRE—See Wire, Spooled.****SPOOLING MACHINES—**

Fairmount Machine Co., Philadelphia, Pa.

SPOOLS, Tin—**SPOON HOLDERS—See Holders, Spoon, Silver Plated.****SPOONS AND FORKS, Iron—**

Acme Shear Co., Bridgeport, Ct.
Atlas Mfg. Co., New Haven, Ct.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Charles Parker Co., Meriden, Ct.
Sidney Shepard & Co., Buffalo, N. Y.

SPOONS AND FORKS, Silver and Silver Plated—

International Silver Co., 9-13 Malden Lane, New York.
Onelda Community, Niagara Falls, N. Y.

SPOONS AND FORKS, Solid Metal—

Charles Parker Co., Meriden, Ct.

SPOONS, Soda Water—

Erie Specialty Co., Erie, Pa.
International Silver Co., 9-13 Malden Lane, New York.

SPOONS, Telegraph—

Terre Haute Shovel & Tool Co., Terre Haute, Ind.

SPOON TRAYS—See Trays, Silver Plated.**SPORTING GOODS, JOBBERS—See Jobbers, Hardware, Cutlery, Tools, Sporting Goods, &c.****SPOUTS, Bang—**

Middleton & Co., Philadelphia, Pa.

SPOUTS, Grain—

Aultman Co., Canton, O.

SPOUTS, Sap—

Charles Millar & Son, Utica, N. Y.

SPRAYERS, Sulky—

Aspinwall Mfg. Co., Jackson, Mich.

SPRAYING PUMPS—See Pumps, Spraying.**SPRING BALANCES—See Balances.****SPRING COILING MACHINES—**

Garvin Machine Co., Spring & Varick Sts., New York.
Hoefler Mfg. Co., Freeport, Ill.
E. J. Manville Machine Co., Waterbury, Ct.
Rudolph & Krummel, Chicago, Ill.

SPRINGS, Agricultural Implement—

American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.

SPRINGS, Air Brake—

Cleveland Wire Spring Co., Cleveland, O.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.

SPRINGS, Bed—

American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.

SPRINGS, Bicycle—

American Steel & Wire Co., Chicago, Ill.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.
Tuck Mfg. Co., Brockton, Mass.

SPRINGS, Bird Cage—

Fred. J. Meyers Mfg. Co., Hamilton, O.
Miller & Van Winkle, Brooklyn, N. Y.
Ossawan Mills Co., Norwich, Ct.
Charles Scott Spring Co., Philadelphia, Pa.
Wire Goods Co., Worcester, Mass.

SPRINGS, Car—

American Steel & Wire Co., Chicago, Ill.
Latrobe Steel Co., Philadelphia, Pa.
Chas. Scott Spring Co., Philadelphia, Pa.

SPRINGS, Carriage, Wagon, &c.—

Concord Axle Co., Penacook, N. H.
Wm. D. Gibson Co., Chicago, Ill.
La Belle Steel Co., Pittsburgh, Pa.
Wm. & Harvey Rowland, Philadelphia, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
Parry Mfg. Co., Indianapolis, Ind.
Charles Scott Spring Co., Philadelphia, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.

SPRINGS, Check—

Miller & Van Winkle, Brooklyn, N. Y.
W. R. Ostrander & Co., 22 Dey St., N. Y.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

SPRINGS, Clearer—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

SPRINGS, Clock—

American Steel & Wire Co., Chicago, Ill.
Boston Gear Works, Boston, Mass.

SPRINGS, Door—

American Steel & Wire Co., Chicago, Ill.
Arcade Mfg. Co., Freeport, Ill.
Caldwell Mfg. Co., Rochester, N. Y.
John Chatillon & Sons, 85 Cliff St., N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Wm. D. Gibson Co., Chicago, Ill.
Larimer Mfg. Co., Latrobe, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.
St. Johns Spring Co., St. Johns, Mich.
Chas. Scott Spring Co., Philadelphia, Pa.
Union Mfg. Co., New Britain, Ct.
Van Wagoner & Williams Hardware Co., Cleveland, O.
Wire Goods Co., Worcester, Mass.

SPRINGS, Door Rubber—

Boston Belting Co., Boston, Mass.

SPRINGS, Electrical Equipment—

Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Chas. Scott Spring Co., Philadelphia, Pa.

SPRINGS, Furniture and Upholstery—

American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.

SPRINGS, Governor—

Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Sabin Machine Co., Montpelier, Vt.
Chas. Scott Spring Co., Philadelphia, Pa.

SPRINGS, Machine—

Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.

SPRINGS, Motor—

American Steel & Wire Co., Chicago, Ill.
Wm. D. Gibson Co., Chicago, Ill.

SPRINGS, Oil Tempered—

Cleveland Wire Spring Co., Cleveland, O.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.

SPRINGS, Organ and Piano—

Wm. D. Gibson Co., Chicago, Ill.
Sabin Machine Co., Montpelier, Vt.

SPRINGS, Pump Valve—

Cleveland Wire Spring Co., Cleveland, O.
Miller & Van Winkle, Brooklyn, N. Y.

SPRINGS, Rocker—

Wm. D. Gibson Co., Chicago, Ill.

SPRINGS, Sash—

Miller & Van Winkle, Brooklyn, N. Y.
Chas. Scott Spring Co., Philadelphia, Pa.

SPRINGS, Seat and Back—

Cleveland Wire Spring Co., Cleveland, O.
Miller & Van Winkle, Brooklyn, N. Y.

SPRINGS, Shuttle—

New England Specialty Co., North Easton, Mass.
Willmot & Hobs Mfg. Co., Bridgeport, Ct.

SPRINGS, Steel—

American Steel & Wire Co., Chicago, Ill.
Wallace Barnes, Bristol, Ct.
Clark & Cowles, Plainville, Ct.
Cleveland Wire Spring Co., Cleveland, O.
Crescent Steel Co., Pittsburgh, Pa.
Dunbar Bros., Bristol, Ct.
Wm. D. Gibson Co., Chicago, Ill.
Jonas & Colver Continental Steel Works, 101 Duane St., New York.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
New England Specialty Co., North Easton, Mass.
Wm. & Harvey Rowland, Philadelphia, Pa.
Sabin Machine Co., Montpelier, Vt.
Chas. Scott Spring Co., Philadelphia, Pa.
Tuck Mfg. Co., Brockton, Mass.
S. & C. Wardlow, 95 John St., New York.

SPRINGS, Trolley—

American Steel & Wire Co., Chicago, Ill.
Wm. D. Gibson Co., Chicago, Ill.

SPRINGS, Typewriter—

American Steel & Wire Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Tuck Mfg. Co., Brockton, Mass.

SPRINGS, Wagon Pole—

Cleveland Wire Spring Co., Cleveland, O.
Miller & Van Winkle, Brooklyn, N. Y.

SPRINGS, Wagon Rubber—

Boston Belting Co., Boston, Mass.

SPRINGS, Watch—

American Steel & Wire Co., Chicago, Ill.

SPRINGS, Wind Mill—

American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.

SPRINGS, Window—

Miller & Van Winkle, Brooklyn, N. Y.
Reading Hardware Co., Reading, Pa.
Chas. Scott Spring Co., Philadelphia, Pa.
Stanley Works, New Britain, Ct.

SPRINGS, Wire—

Wallace Barnes, Bristol, Ct.
John Chatillon & Sons, 85 Cliff St., N. Y.
Cleveland Wire Spring Co., Cleveland, O.
Crescent Steel Co., Pittsburgh, Pa.
Dunbar Bros., Bristol, Ct.
Wm. D. Gibson Co., Chicago, Ill.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Charles Scott Spring Co., Philadelphia, Pa.
Sabin Machine Co., Montpelier, Vt.
St. Johns Spring Co., St. Johns, Mich.
Tuck Mfg. Co., Brockton, Mass.
T. F. Welch Mfg. Co., Boston, Mass.
Wire Goods Co., Worcester, Mass.

SPRINGS, Wringer—

American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
Wm. D. Gibson Co., Chicago, Ill.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.

SPRINKLERS, Lawn—

Crescent Brass & Iron Co., Detroit, Mich.
 Deming Co., Salem, O.
 Enterprise Mfg. Co., Philadelphia, Pa.
 Humphreys Mfg. Co., Mansfield, O.
 John C. Kupferle, St. Louis, Mo.
 John H. McGowan Co., Cincinnati, O.
 McNab & Harlin Mfg. Co., 58 John St., New York.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Philadelphia Lawn Mower Co., Philadelphia, Pa.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Pullman Sash Balance Co., Rochester, N. Y.

SPRINKLERS, Street—

Taunton Locomotive Mfg. Co., Taunton, Mass.

SPRINKLING HEADS—See Heads, Sprinkling.**SPROCKETS, Bicycle—See Bicycle Sprockets.****SPROCKET WHEEL CUTTERS—See Cutters, Sprocket Wheel.****SPROCKET WHEELS—See Wheels, Sprocket.****SPUDS, Tobacco—**

Geo. H. Bishop & Co., Lawrenceburg, Ind.

SQUARE AND GAUGE COMBINED—See Gauge and Square, Combined.**SQUARE ATTACHMENTS—**

Tower & Lyon, 95 Chambers St., New York.

SQUARE LEVELS—See Levels, Bit and Square.**SQUARES, Caliper—**

Brown & Sharpe Mfg. Co., Providence, R. I.

SQUARES, Iron and Steel—

Brown & Sharpe Mfg. Co., Providence, R. I.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

SQUARES, Machinists'—

Athol Machine Co., Athol, Mass.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Henry Disston & Sons, Philadelphia, Pa.
 Hoggson & Pettis Mfg. Co., New Haven, Ct.
 Sawyer Tool Co., Fitchburg, Mass.
 L. S. Starrett Co., Athol, Mass.
 J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

SQUARES, Pocket—

Bemis & Call Hardware & Tool Co., Springfield, Mass.

SQUARES, T—

Brown & Sharpe Mfg. Co., Providence, R. I.
 Henry Disston & Sons, Philadelphia, Pa.

SQUARES, Try and Miter—

Athol Machine Co., Athol, Mass.
 E. C. Atkins & Co., Indianapolis, Ind.
 Henry Disston & Sons, Philadelphia, Pa.
 Stanley Rule & Level Co., New Britain, Ct.
 L. S. Starrett Co., Athol, Mass.

SQUARING INSTRUMENTS—See Instruments, Leveling and Squaring.**SQUEEZERS, Lemon—**

Arcade Mfg. Co., Freeport, Ill.
 Erie Specialty Co., Erie, Pa.
 Hagen & Reid, Troy, N. Y.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Logan & Strobridge Iron Co., New Brighton, Pa.
 Nicol & Co., Chicago, Ill.
 Charles Parker Co., Meriden, Ct.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Sidney Shepard & Co., Buffalo, N. Y.
 John Sommer's Son, Newark, N. J.
 Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
 A. C. Williams, Ravenna, O.

SQUEEZERS, Puddle Ball—

Lloyd Booth Co., Youngstown, O.
 A. Garrison Foundry Co., Pittsburgh, Pa.
 Mesta Machine Co., Pittsburgh, Pa.
 Philadelphia Roll & Machine Co., Philadelphia, Pa.
 Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.

SQUEEZING MACHINES, Can—

E. W. Bliss Co., Brooklyn, N. Y.

STABLE FIXTURES—

W. J. Adams, Joliet, Ill.
 E. T. Barnum, Detroit, Mich.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Belmont Iron Works, Philadelphia, Pa.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 J. E. Bolles Iron & Wire Works, Detroit, Mich.
 Columbus Wire & Iron Works, Columbus, O.
 Edward Darby & Sons, Philadelphia, Pa.
 Ellis & Halfenbarger, Indianapolis, Ind.
 Estey Wire Works Co., 65 Fulton St., N. Y.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Howard & Morse, 45 Fulton St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 National Iron & Wire Co., Cleveland, O.
 Scheeler's Sons, Buffalo, N. Y.
 Stewart Iron Works, Cincinnati, O.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.
 W. S. Tyler Co., Cleveland, O.
 Van Dorn Iron Works Co., Cleveland, O.
 Variety Machine Co., Warsaw, N. Y.
 West Side Foundry Co., Troy, N. Y.

STACKERS, Hay—

Famous Mfg. Co., Chicago, Ill.

STACKS, STEEL—See Chimneys, Steel.**STAIRS, Iron and Steel—**

E. T. Barnum, Detroit, Mich.
 Wm. Bayley & Sons Co., Milwaukee, Wis.
 Belmont Iron Works, Philadelphia, Pa.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
 Forest City Steel & Iron Co., Cleveland, O.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 New England Structural Co., Boston, Mass.
 Stewart Iron Works, Cincinnati, O.
 Van Dorn Iron Works Co., Cleveland, O.

STAIR TREADS, BRASS—See Plates, Brass Step.**STAIR TREADS, RUBBER—See Treads, Stair Rubber.****STAKE CHAINS—See Chains, Picket, Stake, &c.****STAKE HOLDERS, WAGON—See Holders, Stake, Wagon.****STAKES, Timbers'—**

Niagara Machine & Tool Works, Buffalo, N. Y.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

STAMP BOXES—See Boxes, Silver Plated.**STAMPED OR MILLED TURNED METAL WORK TO ORDER—See Metal Work, Milled, Turned or Stamped to Order.****STAMP HOLDERS, RUBBER—See Holders, Rubber Stamp.****STAMPINGS, Bicycle—See Bicycle Parts.****STAMPING, Sheet Metal—**

Adrian Machine Works, Brooklyn, N. Y.
 American Hardware Mfg. Co., Ottawa, Ill.
 Avery Stamping Co., Cleveland, O.
 W. J. Clark Co., Salem, O.
 Clark & Cowles, Plainville, Ct.
 Cleveland Stamping & Tool Co., Cleveland.
 Oliver P. Clay Co., Cleveland, O.
 Davis & Buxton Stamping Co., Worcester, Mass.
 Griffin Mfg. Co., Allegheny, Pa.
 Houghton & Buxton Mfg. Co., Worcester, Mass.
 Indianapolis Drop Forging Co., Indianapolis, Ind.
 E. Konigslow & Bro., Cleveland, O.
 Frank Mossberg Co., Attleboro, Mass.
 Nut & Washer Mfg. Co., Milwaukee, Wis.
 Wilson & Smith, Worcester, Mass.

STAMP MOISTENERS—See Moisteners, Envelope and Stamp.**STAMPS AND DIES, Steel—**

Adrian Machine Works, Brooklyn, N. Y.
 L. A. Eucker Stamp Works, Little Ferry, N. J.
 Hilles & Jones Co., Wilmington, Del.
 Hoggson & Pettis Mfg. Co., New Haven, Ct.
 Howard Iron Works, Buffalo, N. Y.
 E. Konigslow & Bro., Cleveland, O.
 John Loyd, 558 Water St., New York.
 Geo. M. Ness, Jr., 61 Fulton St., N. Y.
 Niagara Machine & Tool Works, Buffalo, N. Y.
 Richard Mfg. Co., Bloomsburg, Pa.
 Schwerdtle & Siebert, Bridgeport, Ct.
 Wilson & Smith, Worcester, Mass.

STAMPS, Brass—

L. A. Eucker Stamp Works, Little Ferry, N. J.
 Geo. M. Ness, Jr., 61 Fulton St., New York.
 Schwerdtle & Siebert, Bridgeport, Ct.

STAMPS, Dating Railroad Ticket—

American Railway Supply Co., 24 Park Place, New York.

STAMPS, Rubber—

Geo. M. Ness, Jr., 61 Fulton St., New York.
 Schwerdtle & Siebert, Bridgeport, Ct.

STANCHIONS, Cattle—

Variety Machine Co., Warsaw, N. Y.
 J. K. Wilder & Son, Monroe, Mich.

STANCHIONS, Hand Rope—

Edson Mfg. Co., Boston, Mass.
 W. & J. Tiebout, 118 Chambers St., N. Y.

STANDARDS AND SOCKETS, Canopy Top—

E. D. Clapp Mfg. Co., Auburn, N. Y.

STANDPIPES—

Wm. B. Pollock Co., Youngstown, O.
 Ritter-Conley Mfg. Co., Pittsburgh, Pa.
 Warren City Boiler Works, Warren, O.
 Wickes Bros., Saginaw, Mich.

STANDS, Adjustable, Reading, Music, &c.—

D. H. Allen & Co., Miamisburg, O.

STANDS AND HOLDERS, Bicycle—

Boston & Lockport Block Co., Boston.
 Bridgeport Gun Implement Co., 313 Broadway, New York.
 Logan & Strobridge Iron Co., New Brighton, Pa.
 F. E. Myers & Bro., Ashland, O.
 H. K. Porter, Everett, Mass.
 Pullman Sash Balance Co., Rochester, N. Y.
 R. H. Wolff & Co., Foot 116th St., N. Y.

STANDS AND LASTS—See Lasts and Stands, Shoe.**STANDS, Axe and Scythe—**

J. D. Warren Mfg. Co., Chicago, Ill.

STANDS, Blower—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

STANDS, Calendar—

Wrightsville Hardware Co., Wrightsville, Pa.

STANDS, Coffee Pot—

Keen & Hagerty Mfg. Co., Baltimore, Md.
 Logan & Strobridge Iron Co., New Brighton, Pa.
 Nicol & Co., Chicago, Ill.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Stover Mfg. Co., Freeport, Ill.
 Wrightsville Hardware Co., Wrightsville, Pa.

STANDS, COFFEE POT, WIRE—See Household Articles, Wire.**STANDS, Copying Press—**

Globe-Wernicke Co., Cincinnati, O.
 Sam'l C. Tatum Co., Cincinnati, O.

STANDS, Display, Garment—

Fred. J. Meyers Mfg. Co., Hamilton, O.

STANDS, Floor—

Geo. V. Cresson Co., Philadelphia, Pa.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.

STANDS, Flower Pot—

D. H. Allen & Co., Miamisburg, O.
 E. T. Barnum, Detroit, Mich.
 Columbus Wire & Iron Works, Columbus, O.
 Edward Darby & Sons, Philadelphia, Pa.
 Estey Wire Works Co., 65 Fulton St., N. Y.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Howard & Morse, 45 Fulton St., New York.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Maine Mfg. Co., Nashua, N. H.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Scheeler's Sons, Buffalo, N. Y.
 Stover Mfg. Co., Freeport, Ill.
 Wright & Colton Wire Cloth Co., Worcester, Mass.

STANDS, Foundry Polishing—

Royersford Foundry & Machine Co., Royersford, Pa.

STANDS, Ironing, Folding—

G. A. Millbradt & Co., St. Louis, Mo.

STANDS, Mule Pulley—

Jones & Laughlins, Ltd., Pittsburgh, Pa.

STANDS, Sad Iron—

Logan & Strobridge Iron Co., New Brighton, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Stover Mfg. Co., Freeport, Ill.
 Wrightsville Hardware Co., Wrightsville, Pa.

STANDS, Shovel and Tong—

Logan & Strobridge Iron Co., New Brighton, Pa.

STANDS, Umbrella—

E. T. Barnum, Detroit, Mich.
 Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
 W. J. Clark Co., Salem, O.
 Edward Darby & Sons, Philadelphia, Pa.
 Estey Wire Works Co., 65 Fulton St., N. Y.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Goodwin & Kintz Co., Winsted, Ct.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Logan & Strobridge Iron Co., New Brighton, Pa.
 Ludlow-Saylor Wire Co., St. Louis, Mo.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
 Scheeler's Sons, Buffalo, N. Y.

STANDS, Wash—

Fred. J. Meyers Mfg. Co., Hamilton, O.

STANDS, Water Cooler and Toilet—

Keen & Hagerty Mfg. Co., Baltimore, Md.

STAND TRUCKS—See Trucks, Barrel and Stand.**STAPLE DRIVERS—See Drivers, Staple.****STAPLE MACHINERY—**

Bates Machine Co., Joliet, Ill.
 E. J. Manville Machine Co., Waterbury, Ct.
 F. B. Shuster Co., New Haven, Ct.

STAPLES—See Wrought Iron Goods.**STAPLES AND LOOPS, Furniture—**

Grand Crossing Tack Co., Grand Crossing, Ill.

STAPLES, Wagon Bow—

Wheeling Hinge Co., Wheeling, W. Va.

STAPLES, WIRE—

American Steel & Wire Co., Chicago, Ill.
 Cobb & Drew, Plymouth, Mass.
 Edward Darby & Sons, Philadelphia, Pa.
 Dillon-Griswold Wire Co., Sterling, Ill.
 Wm. D. Gibson Co., Chicago, Ill.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
 Grand Crossing Tack Co., Grand Crossing, Ill.
 Milwaukee Tack Co., Milwaukee, Wis.
 Geo. W. Stanley Co., Belleville, Ill.
 E. H. Titchener & Co., Binghamton, N. Y.
 Wire Goods Co., Worcester, Mass.
 Wright & Colton Wire Cloth Co., Worcester, Mass.

STARTERS, Bung—

Boston & Lockport Block Co., Boston.
 Union Hardware Co., Torrington, Ct.

STATIC ELECTRICAL MACHINES—See Electrical Machines, Static.**STATIONERS' HARDWARE (Ink-stands, Clips, Pen Racks and Trays, &c.)**

Crescent Brass & Iron Co., Detroit, Mich.
 Goodwin & Kintz Co., Winsted, Ct.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Sam'l C. Tatum Co., Cincinnati, O.

STATION HOUSE CAGES—See Jails, Jail Cells, &c.**STAVE KNIVES—See Knives, Machine.****STAVE SAWING MACHINES—**

Peter Gerlach & Co., Cleveland, O.

STAY BOLT CLIPPERS, ROLLERS—See Clippers, Rollers.**STAY BOLT IRON—See Iron, Rivet and Stay Bolt.****STAY BOLTS, ROLLERS—See Bolts, Rollers.****STAYS, Bicycle—See Bicycle Parts.****STAYS, Roller—**

Lane Bros. Co., Poughkeepsie, N. Y.
 McKinney Mfg. Co., Allegheny, Pa.
 Ney Mfg. Co., Canton, O.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Wm. B. Scaife & Sons, Pittsburgh, Pa.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

STEAK POUNDERS—See Pounders, Steak.**STEAM BOILER INSPECTION—**

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Ct.

STEAM FITTERS' SUPPLIES—

Humphreys Mfg. Co., Mansfield, O.
 Chas. Millar & Son., Utica, N. Y.

STEAMSHIP OUTFITS—

W. H. Thomas & Co., Philadelphia, Pa.

STEEL, Axe—

Brown & Co., Inc., Pittsburgh, Pa.

STEEL BALLS, BARS, &c.—See Balls, Bars, &c.**STEEL, Band Saw—**

American Steel & Wire Co., Chicago, Ill.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Bar—

National Steel Co., Battery Park Building, New York.

STEEL BROKERS AND MERCHANTS—See Iron and Steel Brokers and Merchants.**STEEL BUSHINGS, Seamless—See Bushings, Seamless Steel.****STEEL, Cast—**

Crescent Steel Co., Pittsburgh, Pa.
 Hercules Steel Casting Co., Harvey, Ill.

STEEL, Chrome—

Chrome Steel Works, Brooklyn, N. Y.

STEEL, Clock Spring—

Braeburn Steel Co., Braeburn, Pa.
 Crescent Steel Co., Pittsburgh, Pa.
 Jonas & Colver Continental Steel Works, 101 Duane St., N. Y.
 S. & C. Wardlow, 95 John St., New York.
 R. H. Wolff & Co., Foot 116th St., N. Y.

STEEL, Cold Drawn Shapes—

American Steel Hoop Co., Pittsburgh, Pa.
 Finished Steel Co., Youngstown, O.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Cold Rolled—

Crescent Steel Co., Pittsburgh, Pa.
 Hart & Cooley Mfg. Co., South Chicago, Ill.
 Wm. Jessop & Sons, 91 John St., New York.
 Geo. Johnson, Catsauqua, Pa.
 Jonas & Colver Continental Steel Works, 101 Duane St., N. Y.
 Jones & Laughlins, Ltd., Pittsburgh, Pa.
 Miller & Van Winkle, Brooklyn, N. Y.
 Republic Iron & Steel Co., Chicago, Ill.
 Singer, Nimick & Co., Pittsburgh, Pa.
 S. & C. Wardlow, 95 John St., New York.
 Wheelock, Lovejoy & Co., 23 Cliff St., N. Y.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.
 R. H. Wolff & Co., Foot 116th St., N. Y.

STEEL, COLD ROLLED SHEET, HOT ROLLED SHEET—See Sheet Steel.**STEEL, Cold Rolled Strip—**

Hart & Cooley Mfg. Co., South Chicago, Ill.
 George Nash & Co., Chicago, Ill.
 S. & C. Wardlow, 95 John St., New York.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

STEEL, Combination Plow—

Brown & Co., Inc., Pittsburgh, Pa.

STEEL, Composition—

Brown & Co., Inc., Pittsburgh, Pa.

STEEL, Corset—

Miller & Van Winkle, Brooklyn, N. Y.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.
 R. H. Wolff & Co., Foot 116th St., N. Y.

STEEL, Crucible Cast—

Braeburn Steel Co., Braeburn, Pa.
 Brown & Co., Inc., Pittsburgh, Pa.
 Chrome Steel Works, Brooklyn, N. Y.
 Crescent Steel Co., Pittsburgh, Pa.
 Denman & Davis, 5 Cliff St., New York.
 Henry Disston & Sons, Philadelphia, Pa.
 Hobson, Houghton & Co., 98 John St., N. Y.
 Wm. Jessop & Sons, 91 John St., N. Y.
 Jonas & Colver Continental Steel Works, 101 Duane St., N. Y.
 B. M. Jones & Co., Boston, Mass.
 Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
 La Belle Steel Co., Pittsburgh, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.
 S. & C. Wardlow, 95 John St., New York.
 Wheelock, Lovejoy & Co., 23 Cliff St., N. Y.

STEEL, Cutlery—

La Belle Steel Co., Pittsburgh, Pa.
 Wm. & Harvey Rowland, Philadelphia, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.
 S. & C. Wardlow, 95 John St., New York.

STEEL, Die—

Brown & Co., Inc., Pittsburgh, Pa.
 Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Double Shear—

Brown & Co., Inc., Pittsburgh, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.
 S. & C. Wardlow, 95 John St., New York.

STEEL GOODS BRACKETS—See Brackets, Shovel, Hoe, Rake, Fork, &c.**STEEL GOODS RACKS—See Racks, Steel Goods.****STEEL, Hammer—**

Braeburn Steel Co., Braeburn, Pa.
 Crescent Steel Co., Pittsburgh, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Hot Rolled Strip—

Singer, Nimick & Co., Pittsburgh, Pa.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

STEEL, Key—

Pittsburgh Steel Shafting Co., Pittsburgh, Pa.

STEEL, Lathe—

Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Machinery—

Braeburn Steel Co., Braeburn, Pa.
 Crescent Steel Co., Pittsburgh, Pa.
 Ogden & Wallace, 577 Greenwich St., N. Y.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Mushet's Special—

B. M. Jones & Co., Boston, Mass.

STEEL, Nickel—

Bethlehem Steel Co., South Bethlehem, Pa.

STEEL, Plow—

Brown & Co., Inc., Pittsburgh, Pa.
 La Belle Steel Co., Pittsburgh, Pa.
 Wm. & Harvey Rowland, Philadelphia, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Rock Drill—

Braeburn Steel Co., Braeburn, Pa.
 Brown & Co., Inc., Pittsburgh, Pa.
 Crescent Steel Co., Pittsburgh, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Roller Bearing—

American Steel & Wire Co., Chicago, Ill.
 Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
 La Belle Steel Co., Pittsburgh, Pa.

STEEL ROLLS, HARDENED, FORGED—See Rolls, Hardened, Forged Steel.**STEEL, Saw—**

Crescent Steel Co., Pittsburgh, Pa.
 Henry Disston & Sons, Philadelphia, Pa.
 Jonas & Colver Continental Steel Works, 101 Duane St., N. Y.
 George Nash & Co., Chicago, Ill.
 Singer, Nimick & Co., Pittsburgh, Pa.
 S. & C. Wardlow, 95 John St., New York.
 R. H. Wolff & Co., Foot 116th St., N. Y.

STEELS, Butcher, &c.—

American Cutlery Co., Chicago, Ill.
 John Chatillon & Sons, 85 Cliff St., N. Y.
 Goodell Co., Antrim, N. H.
 C. & A. Hoffman, Frankford, Philadelphia.
 Nicholson File Co., Providence, R. I.

STEELS, Buffer and Scraper—

Tuck Mfg. Co., Brockton, Mass.

STEEL, Self Hardening—

Crescent Steel Co., Pittsburgh, Pa.
Wm. Jessop & Sons, 91 John St., New York.

STEEL, Shovel—

Wm. & Harvey Rowland, Philadelphia, Pa.

STEEL, Skate—

La Belle Steel Co., Pittsburgh, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, SWEDISH—See Iron and Steel, Swedish.**STEEL, Tape Line—**

American Steel & Wire Co., Chicago, Ill.

STEEL, Tire—

Singer, Nimick & Co., Pittsburgh, Pa.

STEEL, Tool—

Braeburn Steel Co., Braeburn, Pa.
Crescent Steel Co., Pittsburgh, Pa.
Denman & Davis, 5 Cliff St., New York.
Henry Disston & Sons, Philadelphia, Pa.
Hobson, Houghton & Co., 98 John St., N. Y.
Wm. Jessop & Sons, 91 John St., New York.
Jonas & Colver Continental Steel Works, 101 Duane St., N. Y.
B. M. Jones & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
George Nash & Co., Chicago, Ill.
Pittsburgh Shear Knife & Machine Co., Pittsburgh, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
E. H. Stroud & Co., Chicago, Ill.
Samuel Trethewey & Co., Pittsburgh, Pa.
Edgar T. Ward & Sons, Boston, Mass.
S. & C. Wardlow, 95 John St., New York.
Wheelock, Lovejoy & Co., 23 Cliff St., N. Y.

STEEL, Watch Spring—

Crescent Steel Co., Pittsburgh, Pa.
S. & C. Wardlow, 95 John St., New York.
R. H. Wolff & Co., Foot 116th St., N. Y.

STEEL, Welded, Chrome Steel and Iron—

Chrome Steel Works, Brooklyn, N. Y.

STEEL WIRE BRUSHES—See Brushes, Steel Wire.**STEEL WIRE, CAST—See Wire, Cast Steel.****STEEL WORKS MACHINERY—**

Mesta Machinery Co., Pittsburgh, Pa.

STEELYARDS—

Bemis & Call Hardware & Tool Co., Springfield, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

STEERING GEARS, Steam—

Pawling & Harnischfeger, Milwaukee, Wis.

STENCILS—

L. A. Eucker Stamp Works, Little Ferry, N. J.
Hoggson & Pettis Mfg. Co., New Haven, Ct.
S. G. Monce, Unionville, Ct.
Geo. M. Ness, Jr., 61 Fulton St., New York.
Schwerdtle & Siebert, Bridgeport, Ct.

STENOGRAPHERS' COPY HOLDERS—See Holders, Stenographers', Copy.**STEP LADDER JOINTS—See Joints, Step Ladder.****STEP LADDERS—See Ladders, Step.****STEP PLATES, BRASS—See Plates, Brass, Step.****STEPS, Car—**

Q & C Company, Chicago, Ill.

STEPS, Telegraph Pole—

Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.

STEPS, Wagon and Carriage—

American Steel & Wire Co., Chicago, Ill.
Atwater Mfg. Co., Southington, Ct.
Strieby & Foote Co., Newark, N. J.

STEREOTYPE, METAL—

Theo. Hertz & Son, St. Louis, Mo.
I. Shonberg, 172 Hudson St., New York.

STEREOTYPERS' TOOLS—See Tools, Stereotype.**STEREOTYPING—**

St. Louis Electrotype Foundry, St. Louis.

STEW PANS, SECTIONAL—See Pans, Sectional Stew.**STIFFENERS, Heel—**

Nelson Lyon, Albany, N. Y.
Star Heel Plate Co., Newark, N. J.
Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

STILLS, Oil and Tar—

Ritter-Conley Mfg. Co., Pittsburgh, Pa.

STIRRUPS, Machine—

Wm. H. Haskell Mfg. Co., Pawtucket, R. I.

STIRRUPS, Saddle—

Wrightsville Hardware Co., Wrightsville, Pa.

STIRRUPS, Timber—

Port Chester Bolt & Nut Co., Port Chester, N. Y.
Steward & Romaine Mfg. Co., Philadelphia.

STITCHING MACHINES, WIRE—See Wire Stitching Machines.**STOCK MARKS, SCALES, TANKS—See Marks, Scales, Tanks.****STOCKS, TAPS AND DIES—**

Acme Machinery Co., Cleveland, O.
Armstrong Mfg. Co., Bridgeport, Ct.
C. H. Bealy & Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Ct.
Butterfield & Co., Derby Line, Vt.
S. W. Card Mfg. Co., Mansfield, Mass.
Curtis & Curtis, Bridgeport, Ct.
Fairbanks Co., 311 Broadway, New York.
Hollands Mfg. Co., Erie, Pa.
Humphryes Mfg. Co., Mansfield, Mass.
Jarecki Mfg. Co., Erie, Pa.
J. M. King & Co., Waterford, N. Y.
Manning, Maxwell & Moore, 85 Liberty St., New York.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.
E. F. Reece Co., Greenfield, Mass.
Reliance Machine & Tool Co., Cleveland, O.
D. Saunders' Sons, Yonkers, N. Y.
Standard Tool Co., Cleveland, O.
Wells Bros & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

STOCK WATERERS—

J. N. Reimers, Davenport, Ia.
Sandwich Enterprise Co., Sandwich, Ill.
Stover Mfg. Co., Freeport, Ill.

STOKERS, Mechanical—

Babcock & Wilcox Co., 29 Cortlandt St., New York.
Alfred Box & Co., Philadelphia, Pa.
Cahall Sales Department, Pittsburgh, Pa.
Ideal Fuel Feeder Co., 31 Burling Slip, New York.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
W. W. Whitehead, Davenport, Iowa.

STONE CUTTERS' CHISELS—See Chisels, Brick, Stone Cutters', &c.**STONE MOLDING MACHINES, PLANERS, SAWS, WIRE—See Molding Machines, Planers, Saws, Wire.****STONERS, Cherry—**

Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Goodell Co., Antrim, N. H.
Logan & Strobridge Iron Co., New Brighton, Pa.

STONES, Axe—

Cleveland Stone Co., Cleveland, O.
Pike Mfg. Co., Pike Station, N. H.

STONES, Emery—

American Emery Wheel Works, Boston.
American Machinery Co., Grand Rapids, Mich.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Norton Emery Wheel Co., Worcester, Mass.
Pike Mfg. Co., Pike Station, N. H.
Tanite Co., Stroudsburg, Pa.
Vitrified Wheel Co., Westfield, Mass.

STONES, GRIND—See Grindstones.**STONES, Oil and Water—**

American Emery Wheel Works, Providence, R. I.
American Machinery Co., Grand Rapids, Mich.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Norton Emery Wheel Co., Worcester, Mass.
Pike Mfg. Co., Pike Station, N. H.
Scranton Codundum & Emery Wheel Co., Scranton, Pa.
Tanite Co., Stroudsburg, Pa.

STONES, Scythe—

Cleveland Stone Co., Cleveland, O.
Pike Mfg. Co., Pike Station, N. H.

STONE WORKING MACHINERY—

Farrel Foundry & Mach. Co., Ansonia, Ct.
J. Gilmour, Bennett Building, New York.
F. R. Patch Mfg. Co., Rutland, Vt.

STOOLS, Camp—

Stanley Works, New Britain, Ct.

STOOLS, OFFICE—See Chairs and Stools, Office.**STOOLS, STORE—See Store Stools.****STOPS, Bead—**

Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

STOPS, Bench—

Millers Falls Co., 28 Warren St., New York.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stover Mfg. Co., Freeport, Ill.
Sam'l C. Tatum Co., Cincinnati, O.

STOPS, Door—

Jos. Bardsley, 147-151 Baxter St., N. Y.
Caldwell Mfg. Co., Rochester, N. Y.
Norwalk Lock Co., South Norwalk Ct.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

STORAGE, Pig Iron—

American Pig Iron Storage Warrant Co., 44 Wall St., New York.

STORE DOOR SHUTTER SCREWS—See Screws, Shutter, Store Door.**STORE FIXTURE BRACKETS, LADDERS, TRUCKS—See Brackets, Ladders, Trucks.****STORE FIXTURES, Wire—**

Fred. J. Meyers Mfg. Co., Hamilton, O.
W. S. Tyler Co., Cleveland, O.

STORE STOOLS—

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Fred. J. Meyers Mfg. Co., Hamilton, O.

STORM, SASH HANGERS, &c.—See Hangers, &c.**STORM WINDOW FASTENERS—See Fasteners, Storm Window.****STOVE BLANKS—**

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

STOVE BOLTS, BRUSHES, &c.—See Bolts, Brushes, &c.**STOVE CASTERS—See Casters, Stove.****STOVE FIXTURES, Display—**

A. & T. McKenna, Pittsburgh, Pa.

STOVE, Hot Water—

V. Clad & Sons, Philadelphia, Pa.

STOVE PIPE—See Pipe, Stove.**STOVE PIPE ELBOWS—See Elbows, Stove Pipe.****STOVE PIPE REGISTERS, SHELVES, &c.—See Registers, Shelves, &c.****STOVE POLISHING MITTENS—See Mittens, Stove Polishing.****STOVE REPAIRS, Extension Grates, Backs, &c.—**

Adams Co., Dubuque, Ia.

STOVES AND RANGES, Gas, Gasoline and Oil—

Albany Foundry Co., Albany, N. Y.
Hollands Mfg. Co., Erie, Pa.
Schneider & Trenkamp Co., Cleveland, O.

STOVES, Fire Brick—

Julian Kennedy, Pittsburgh, Pa.
David Lamond, Pittsburgh, Pa.
G. W. McClure & Son, Pittsburgh, Pa.

STOVES, Hot Water—

V. Clad & Sons, Philadelphia, Pa.

STOVES, Gas, Laundry—

Wm. M. Crane Co., 1131 Broadway, N. Y.
Schneider & Trenkamp Co., Cleveland, O.
V. Clad & Sons, Philadelphia, Pa.

STOVES, Oil Lamp—

Plume & Atwood Mfg. Co., Waterbury, Ct.
Taylor & Boggis Foundry Co., Cleveland, O.

STOVES, Plasterers—

Thos. Carlin's Sons, Allegheny, Pa.

STOVES, Tailors—

Wm. M. Crane Co., 1131 Broadway, N. Y.

STOVES, Wood and Coal—

Albany Foundry Co., Albany, N. Y.
Concord Axle Co., Penacook, N. H.
Hess, Snyder & Co., Massillon, O.
West Side Foundry Co., Troy, N. Y.

STRAIGHT EDGES—See Edges, Straight.**STRAIGHTENERS, Hair—**

Nicol & Co., Chicago, Ill.

STRAIGHTENERS, Shaft—

Philadelphia Roll & Machine Co., Philadelphia, Pa.

STRAIGHTENING AND CUTTING MACHINES, Strip Metal—

Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

STRAIGHTENING AND CUTTING MACHINES, Wire—

Automatic Machine Co., Bridgeport, Ct.
Belden Machine Co., New Haven, Ct.
Chandler & Farquhar, Boston, Mass.
Cross & Speirs Machine Co., Waterbury, Ct.
Hoefler Mfg. Co., Freeport, Ill.
E. J. Manville Machine Co., Waterbury, Ct.
A. H. Nilson Machine Co., Bridgeport, Ct.
F. B. Shuster Co., New Haven, Ct.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

STRAIGHTENING MACHINERY, Plate—

Bement, Miles & Co., Philadelphia, Pa.
Diamond Drill & Machine Co., Birdsboro, Pa.
Hilles & Jones Co., Wilmington, Del.
E. J. Manville Machine Co., Waterbury, Ct.
Niles Tool Works Co., Hamilton, O.
Philadelphia Machine Tool Co., Philadelphia, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

STRAIGHTENING MACHINES, Angle, Beam and Channel—

Diamond Drill & Machine Co., Birdsboro, Pa.
Hilles & Jones Co., Wilmington, Del.

STRAIGHTENING MACHINES, SHAFT—See Shaft Straightening Machinery.**STRAIGHTENING PRESSES, Axle—**

Watson-Stillman Co., 204-210 East 43d St., New York.

STRAIGHTENING ROLLS—

Diamond Drill & Machine Co., Birdsboro, Pa.
Philadelphia Roll & Machine Co., Philadelphia, Pa.

STRAINERS—See Kitchen Articles, Wire.**STRAINERS, Conductor Pipe—**

Berger Bros., Philadelphia, Pa.
Clark, Quilen & Morse, Peoria, Ill.
Edward Darby & Sons, Philadelphia, Pa.
Estey Wire Works Co., 65 Fulton St., N. Y.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Fred J. Meyers Mfg. Co., Hamilton, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

STRAINERS, Sink—

Nelson Lyon, Albany, N. Y.

STRAINERS, Suction, Globe, &c.—

Edson Mfg. Co., Boston, Mass.

STRAINERS, Tea, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

STRAINERS, Tube Well—

A. D. Cook, Lawrenceburg, Ind.

STRAP AND T HINGES—See Hinges, Strap and T.**STRAPPING AND BUFFING MACHINES—See Buffing and Polishing Machines.****STRAPS, Baggage Check—**

American Railway Supply Co., 24 Park Place, New York.

STRAPS, Blanket—

Covert's Saddlery Works, Farmer, N. Y.

STRAPS, Box—

American Steel & Wire Co., Chicago, Ill.
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Cary Mfg. Co., 19-21 Roosevelt St., N. Y.

STRAPS, Curtain—

Covert's Saddlery Works, Farmer, N. Y.
McKinnon Dash Co., Buffalo, N. Y.

STRAPS, Gas Pipe—

Berger Brothers Co., Philadelphia, Pa.

STRAPS, Hame—

Covert's Saddlery Works, Farmer, N. Y.

STRAPS, Hammer, Malleable—

Milwaukee Malleable & Grey Iron Works, Milwaukee, Wis.

STRAPS, Sleigh Bell—

Bevin Bros. Mfg. Co., Easthampton, Ct.

STRAP WORK—See Harness and Strap Work.**STRAW KNIVES—See Knives, Hay and Straw.****STREET FORKS—See Forks, Hay, Manure, Spading, &c.****STREET LAMPS, SCRAPERS—See Lamps, Scrapers.****STRETCHERS, Box Strap—**

Cary Mfg. Co., 59 Elm St., New York.

STRETCHERS, Carpet—

Peck, Stow & Wilcox Co., 27 Murray St., New York.

STRETCHERS, Fence and Wire—

American Steel & Wire Co., Chicago, Ill.
Arcade Mfg. Co., Freeport, Ill.
De Kalb Fence Co., De Kalb, Ill.
Dwiggins Wire Fence Co., Anderson, Ind.
W. C. Heller & Co., Montclair, N. J.
Janesville Hay Tool Co., Janesville, Wis.
Logan & Strobridge Iron Co., New Brighton, Pa.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Metropolitan Daylight Lamp Co., Chicago, Ill.
Ney Mfg. Co., Canton, O.
Pullman Sash Balance Co., Rochester, N. Y.

STRETCHERS, Saw—

Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
See also *Rods, Saw.*

STRETCHERS, Trouser—

Covert Mfg. Co., West Troy, N. Y.

STRIKERS, Lock and Latch—

See also *Locks, Latches, &c.*

STRINGERS, Fish—

Onelda Community, Niagara Falls, N. Y.

STRIPS, Leather—

Baxter, Schenkelberger & Co., Boston, Mass.

STRIP STEEL, COLD ROLLED—See Steel, Cold Rolled Strip.**STROPS, Razor—**

Cattaraugus Cutlery Co., Little Valley, N. Y.

STRUCTURAL MATERIAL—

Allentown Rolling Mills, Allentown, Pa.
American Steel & Wire Co., Chicago, Ill.
Berlin Iron Bridge Co., East Berlin, Ct.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Barclay W. Cotton & Co., Philadelphia, Pa.
Forest City Steel & Iron Co., Cleveland, O.
C. B. Houston & Co., Philadelphia, Pa.
Illinois Steel Co., Chicago, Ill.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
W. W. Lindsay & Co., Philadelphia, Pa.
New England Structural Co., Boston, Mass.
John B. Newkirk & Co., Philadelphia, Pa.
B. Nicoll & Co., 66 Wall St., New York.

Northern Engineering Works, Detroit, Mich.

Passaic Rolling Mill Co., Paterson, N. J.
Phoenix Iron Co., Philadelphia, Pa.
Pierston & Co., 29 Broadway, New York.
A. & P. Roberts Co., Philadelphia, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Shiffler Bridge Co., Pittsburgh, Pa.
E. H. Stroud & Co., Chicago, Ill.
Wm. H. Wallace & Co., 66 Broadway, N. Y.
West Side Foundry Co., Troy, N. Y.

STUBS AND PLATES, Store Shutter—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
Reading Hardware Co., Reading, Pa.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

STUD BOLTS, CHAINS—See Bolts, Chains.**STUDS, Brass and Iron—**

American Iron & Steel Mfg. Co., Lebanon, Pa.
Blake & Johnson, Waterbury, Ct.
Chicago Screw Co., Chicago, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
New Britain Hardware Mfg. Co., New Britain, Ct.
Pittsburgh Screw & Bolt Co., Pittsburgh.

STUFFERS, Sausage—

Enterprise Mfg. Co., Philadelphia, Pa.
National Specialty Mfg. Co., Philadelphia.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Silver Mfg. Co., Salem, O.

STUMP JOINTS—See Joints, Stump.**SUBMARINE CABLES—See Cables, Submarine.****SUCTION FAUCETS—See Faucets, Suction.****SUCTION STRAINERS—See Strainers, Suction, Globe, &c.****SUGAR ARCHES—**

Variety Machine Co., Warsaw, N. Y.

SUGAR MACHINERY—

Geo. V. Cresson Co., Philadelphia, Pa.
Farrel Foundry & Mach. Co., Ansonia, Ct.
R. D. Wood & Co., Philadelphia, Pa.

SULPHURIC ACID—See Acid, Sulphuric.**SUMMER FRONT AND GRATE FRAMES—See Grate Frames and Summer Fronts.****SUMMER HOUSES—See Houses, Wire, Summer.****SUPPLIES, FOUNDRY, MILL, &c.—See Foundry, Mill, &c.****SUPPLIES, GRINDERS' AND POLISHERS—See Grinders' and Polishers' Supplies.****SUPPLIES, Paper Makers—See Paper Makers' Supplies.****SUPPLIES, TUBES, WELL—See Well, Tube, Supplies.****SUPPLY PIPES—See Pipes, Flush and Supply.****SUPPORTS AND BOLTS, Sash—**

Smith & Egge Mfg. Co., Bridgeport, Ct.

SUPPORTS, Counter—

E. T. Barnum, Detroit, Mich.
Logan & Strobridge Iron Co., New Brighton, Pa.
Fred J. Meyers Mfg. Co., Hamilton, O.

SUPPORTS, Foot Rail—

John C. Kupferle, St. Louis, Mo.

SUPPORTS, Porch—

John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.

SUPPORTS, Shelf—

Coleman Hardware Co., Chicago, Ill.
Reading Hardware Co., Reading, Pa.

SURFACE GRINDERS—See Grinders, Surface.**SURFACE PLATES, Standard—**

Brown & Sharpe Mfg. Co., Providence, R. I.
Gould & Eberhardt, Newark, N. J.

SWAGE BLOCKS—See Blocks, Swage.**SWAGES, Saw Tooth—**

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

SWAGING MACHINES—

E. W. Bliss Co., Brooklyn, N. Y.
Excelsior Needle Co., Torrington, Ct.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Williams, White & Co., Moline, Ill.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

SWAMP HOOKS—See Hooks, Log, Swamp, &c.**SWEDISH IRON AND STEEL—See Iron and Steel, Swedish.****SWEEPERS, LAWN—**

Philadelphia Lawn Mower Co., Philadelphia, Pa.

SWEEPERS, Street Railroad—

Taunton Locomotive Mfg. Co., Taunton, Mass.

SWEEPING BRUSHES—See Brushes, Whitewash, Horse, &c.**SWEEPING MACHINES, Street—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Edson Mfg. Co., Boston, Mass.

SWINGS, Child's—

Imperial Bit & Snap Co., Racine, Wis.

SWINGS, Lawn—

Asplnwall Mfg. Co., Jackson, Mich.
Goshen Mfg. Co., Goshen, Ind.
F. E. Myers & Bro., Ashland, O.

SWITCHBOARDS—

General Electric Co., Schenectady, N. Y.
Rawson Electric Co., Elyria, O.
Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

SWITCHES AND FROGS, Railroad—

Allentown Rolling Mills, Allentown, Pa.
Atlas Bolt & Screw Co., Cleveland, O.
Thos. Carlin's Sons, Allegheny, Pa.
Lorain Steel Co., Lorain, O.
Trenton Iron Co., Trenton, N. J.

SWITCHING ROPES—See Ropes, Locomotive Switching.**SWIVEL FORGING MACHINES, Chain—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

SWIVELS, Chain—

Bradlee & Co., Philadelphia, Pa.
Garland Chain Co., Rankin Station, Pa.
Keystone Drop Forge Co., Philadelphia, Pa.
Onelda Community, Niagara Falls, N. Y.

SWIVELS, HALTER, HARNESS, &c.—See Snaps and Swivels, Halter, Harness, &c.**SWIVELS, Rope—**

W. & J. Tiebout, 118 Chambers St., N. Y.

SYRUP PITCHERS—See Pitchers, Silver Plated.**TABLE BRACKETS, CUTLERY, &c.—See Brackets, Cutlery, &c.****TABLES, Brass—**

Edward Miller & Co., Meriden, Ct.

TABLES, Drawing—

R. E. Kidder, Worcester, Mass.

TABLES, Folding—

Maine Mfg. Co., Nashua, N. H.
Anthony Wayne Mfg. Co., Fort Wayne, Ind.

TABLES, Hotel, Steam and Carving—

V. Clad & Sons, Philadelphia, Pa.

TABLES, Ironing—

Hill Dryer Co., Worcester, Mass.

TABLES, LOCOMOTIVE TRANSFER—See Transfer Tables, Locomotive.**TABLES, Lunch Bar—**

Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
V. Clad & Sons, Philadelphia, Pa.

TABLES, Office—

Globe-Wernicke Co., Cincinnati, O.

TABLES, Onyx—

Edward Miller & Co., Meriden, Ct.

TABLES, Saw—

Dupont Mfg. Co., St. Johnsbury, Vt.
Kimball Bros. & Sprague, Brockton, Mass.

TABLETS, Bronze—

Murdock Parlor Grate Co., Boston, Mass.

TABLETS, Desk—

Sam'l C. Tatum Co., Cincinnati, O.

TABLETS, Telephone—

Sam'l C. Tatum Co., Cincinnati, O.

TACHOMETERS—See Indicators, Speed.**TACK CLAWS, HAMMERS, PULLERS—See Claws, Hammers, Pullers.****TACKLE BLOCKS, PULLEYS, &c.—See Blocks, Pulleys, &c.****TACK MACHINERY—**

Kimball Bros. & Sprague, Brockton, Mass.
Henry Perkins, Bridgewater, Mass.
F. B. Shuster Co., New Haven, Ct.
W. A. Sweetser, Brockton, Mass.

TACKS AND NAILS, Copper—

Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Shelton Co., Derby, Ct.

TACKS AND NAILS, Shoe—

Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Ripley & Bartlett, Plymouth, Mass.
Shelton Co., Derby, Ct.

TACKS AND NAILS, Zinc—

Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.

TACKS, Box, Basket, &c.—

Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
E. Phillips & Son, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.

TACKS, Brads, Finishing Nails, &c.—

American Steel & Wire Co., Chicago, Ill.
Jesse Atherton, Auburn, R. I.
Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.
Shelton Co., Derby, Ct.
Wire Goods Co., Worcester, Mass.

TACKS, Bronze—

Phosphor-Bronze Smelting Co., Philadelphia, Pa.

TACKS, Double-pointed—

American Steel & Wire Co., Chicago, Ill.
Cobb & Drew, Plymouth, Mass.
Wm. D. Gibson Co., Chicago, Ill.
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
Geo. W. Stanley Co., Belleville, Ill.
E. H. Titchener & Co., Binghamton, N. Y.
Wire Goods Co., Worcester, Mass.
Wright & Colton Wire Cloth Co., Worcester, Mass.

TACKS, Rubber Head—

H. A. Canfield, Bridgeport, Ct.

TACKS, Trimmers—

Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Shelton Co., Derby, Ct.

TACKS, Upholsterers, Gimp and Lace—

Cobb & Drew, Plymouth, Mass.
Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
E. Phillips & Sons, South Hanover, Mass.
Plymouth Mills, Plymouth, Mass.
Ripley & Bartlett, Plymouth, Mass.
Shelton Co., Derby, Ct.

TACK WIRE—See Wire, Tack.**TAG FASTENERS—See Fasteners, Tag.****TAGS, Brass—**

Norwalk Lock Co., South Norwalk, Ct.
Waterbury Brass Co., Waterbury, Ct.

TAIL COMBS—See Combs, Mane and Tail.**TALLOW POTS—See Pots.****TANK GOVERNORS, HEATERS, &c.—See Governors, Heaters, &c.****TANKS, BLOW OFF—See Blow Off Tanks.****TANKS, Copying Pad and Appliances—**

Sam'l C. Tatum Co., Cincinnati, O.

TANKS, Factory—

Littleford Bros., Cincinnati, O.
Wm. B. Pollock Co., Youngstown, O.
Ripley & Bartlett, Plymouth, Mass.
Wm. B. Scalf & Sons, Pittsburgh, Pa.
Warren City Boiler Works, Warren, O.

TANKS, Gas, Air, Soda, &c.—

Avery Stamping Co., Cleveland, O.
Gleason-Peters Air Pump Co., Houston and Mercer Sts., New York.
Janney, Steinmetz & Co., Philadelphia, Pa.
Wm. B. Pollock Co., Youngstown, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. B. Scalf & Sons, Pittsburgh, Pa.

TANKS, Grain—

Lee-Oldum Boiler Co., Memphis, Tenn.

TANKS, Hot Water—

V. Clad & Sons, Philadelphia, Pa.
Wm. B. Scalf & Sons, Pittsburgh, Pa.

TANKS, Oil—

Lee-Oldum Boiler Co., Memphis, Tenn.
Wm. B. Pollock Co., Youngstown, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. B. Scalf & Sons, Pittsburgh, Pa.
Sidney Shepard & Co., Buffalo, N. Y.
Anthony Wayne Mfg. Co., Fort Wayne, Ind.

TANKS, Stock and Wind Mill—

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Flint & Walling Mfg. Co., Kendallville, Ill.
Lee-Oldum Boiler Co., Memphis, Tenn.
Sandwich Enterprise Co., Sandwich, Ill.
Wm. B. Scalf & Sons, Pittsburgh, Pa.
Stover Mfg. Co., Freeport, Ill.
Warren City Boiler Works, Warren, O.
R. W. Whitehurst & Co., Norfolk, Va.

TANKS, Stove—

Rome Mfg. Co., Rome, N. Y.
Wm. B. Scalf & Sons, Pittsburgh, Pa.

TANKS, Wagon, Oil and Sprinkling—

Littleford Bros., Cincinnati, O.

TANK WORK—

Northern Engineering Works, Detroit, Mich.
Wm. B. Pollock Co., Youngstown, O.
Ritter-Conley Mfg. Co., Pittsburgh, Pa.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Warren City Boiler Works, Warren, O.
Robert Wetherill & Co., Chester, Pa.
Wickes Bros., Saginaw, Mich.

TANNERY MACHINERY—

Geo. V. Cresson Co., Philadelphia, Pa.

TAP BOLTS, DRILLS, &c.—See Bolts, Drill and Tap, &c.**TAPE, Electric—**

Boston Belting Co., Boston, Mass.

TAPE MEASURES—See Measures, Tape.**TAPER THREADING MACHINES—**

Acme Machinery Co., Cleveland, O.

TAPPING AND REAMING MACHINES, Pneumatic—

Chicago Pneumatic Tool Co., Chicago, Ill.
Standard Pneumatic Tool Co., Chicago, Ill.

TAPPING AND REAMING MACHINES, Portable—

Chicago Flexible Shaft Co., Chicago, Ill.
Stow Flexible Shaft Co., Philadelphia, Pa.
Stow Mfg. Co., Binghamton, N. Y.

TAPPING ATTACHMENTS, Automatic—

Gould & Eberhardt, Newark, N. J.

TAPPING MACHINES—

Acme Machinery Co., Cleveland, O.
Baker Bros., Toledo, O.
J. E. Costello Machine Works, Brooklyn, N. Y.
Exeter Machine Works, Exeter, N. H.
Garvin Machine Co., Spring and Varick Sts., New York.
Gould & Eberhardt, Newark, N. J.
Harvey Hubbell, Bridgeport, Ct.
Hill, Clarke & Co., Boston, Mass.
E. J. Manville Machine Co., Waterbury, Ct.
Niles Tool Works Co., Hamilton, O.
Pratt & Whitney Co., Hartford, Ct.
Prentiss Tool & Supply Co., 115 Liberty St., New York.
A. D. Quint, Hartford, Ct.
D. Saunders' Sons, Yonkers, N. Y.
Stow Mfg. Co., Binghamton, N. Y.
Woodward & Rogers, Hartford, Ct.

TAPPING MACHINES, Nut—

Acme Machinery Co., Cleveland, O.
Howard Iron Works, Buffalo, N. Y.
National Machinery Co., Tiffin, O.
Niles Tool Works Co., Hamilton, O.
Reliance Machine & Tool Co., Cleveland, O.
Wells Bros. & Co., Greenfield, Mass.

TAPPING MACHINES, Turnbuckle—

National Machinery Co., Tiffin, O.

TAPS AND DIES—See Stocks, Taps and Dies.**TAPS AND DRILLS—**

Chas. H. Besly & Co., Chicago, Ill.
Butterfield & Co., Derby Line, Vt.
Chicago Screw Co., Chicago, Ill.
Cleveland Twist Drill Co., Cleveland, O.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Pratt & Whitney Co., Hartford, Ct.
E. F. Reece Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

TAPS AND REAMERS, Pipe—

Morse Twist Drill & Mach. Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.
Sandwich Enterprise Co., Sandwich, Ill.
D. Saunders' Sons, Yonkers, N. Y.
Wiley & Russell Mfg. Co., Greenfield, Mass.

TAPS, Collapsible and Adjustable—

Geometric Drill Co., New Haven, Ct.

TAR FURNACES—See Furnaces, Portable, &c.**TARGETS, Cast Iron—**

John C. Kupferle, St. Louis, Mo.

TARGETS, Trap—

Markle Lead Works, St. Louis, Mo.

TAR PAPER SATURATING MACHINES—See Saturating Machines for Tar Paper.**TEA BELLS, KETTLES, &c.—See Bells, Kettles, &c.****TEES—See Angles and Tees.****TEETH, Cider Mill—**

Shelton Co., Derby, Ct.

TEETH, Coal Breaker—

Keystone Drop Forge Co., Philadelphia, Pa.

TEETH, Harrow—

Republic Iron & Steel Co., Chicago, Ill.
St. Johns Spring Co., St. Johns, Mich.

TEETH, Rake—

American Steel & Wire Co., Chicago, Ill.
La Belle Steel Co., Pittsburgh, Pa.

TEETH, Threshing Machine—

Keystone Drop Forge Co., Philadelphia.
Rhode Island Tool Co., Providence, R. I.
Transue & Williams Co., Alliance, O.

TELEGRAPH AND TELEPHONE GOODS—

W. R. Ostrander & Co., 22 Dey St., N. Y.
Rawson Electric Co., Elyria, O.

TELEGRAPH AND TELEPHONE POLE SUPPLIES, Pins, Brackets, Cross Arms, Cleats, &c.—

J. R. Clark Co., Minneapolis, Minn.

TELEGRAPH AND TELEPHONE WIRE—See Wire, Electrical.**TELEPHONE AND TELEGRAPH GOODS—See Telegraph and Telephone Goods.****TELEPHONE BELLS—See Bells, Telephone.****TELEPHONES—**

Palmer Bros., Manus, Ct.
Rawson Electric Co., Elyria, O.

TEMPERATURE RECORDING INSTRUMENTS—See Recording Instruments, Temperature.**TENNIS BELTS—See Belts, Bicycle, Tennis, &c.****TENNIS SOLING RUBBER—See Soling Rubber.****TENONING MACHINES—**

W. F. & John Barnes Co., Rockford, Ill.

TENON MACHINES, SPOKE—See Spoke Tenon Machines.**TEN PINS AND BALLS—**

Boston & Lockport Block Co., Boston.
See also Balls, Ten Pin.

TENSION CARRIAGES—

Link-Belt Engineering Co., Philadelphia.

TERNE PLATE—See Plate, Tin and Terne.**TERRA COTTA PIPE—See Pipe, Terra Cotta.****TESTER, Center—**

J. T. Slocumb & Co., Providence, R. I.
L. S. Starrett Co., Athol, Mass.

TESTER, Flour—

E. C. Atkins & Co., Indianapolis, Ind.

TESTING MACHINES, Cement—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

TESTING MACHINES, Chain—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

TESTING MACHINES, Metal—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

TESTING MACHINES, Oil—

Pratt & Whitney Co., Hartford, Ct.

TESTING MACHINES, Torsion—

Pratt & Whitney Co., Hartford, Ct.

TESTING MACHINES, Traction—

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

TESTING MACHINES, Wire—

Morgan Construction Co., Worcester, Mass.

TESTING PRESSES, Pipe—

Watson-Stillman Co., 204-210 East 43d St., New York.

TESTING SCALES, CEMENT—See Scales, Cement Testing.**TESTING SCALES, GRAIN—See Scales, Grain Testing.****TESTS, Drop—**

Whiting Foundry Equipment Co., Harvey, Ill.

TETHERS, Animal—

Athol Machine Co., Athol, Mass.

TEXTILE MACHINERY—

Fairmount Machine Co., Philadelphia, Pa.
A. B. Pitkin Machinery Co., Providence, R. I.

THERMOMETERS—

Ashton Valve Co., Boston, Mass.
Buffalo Specialty Mfg. Co., Buffalo, N. Y.
Crosby Steam Gage & Valve Co., Boston.

THERMOMETERS, Recording—

Bristol Co., Waterbury, Ct.

THERMOMETERS, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.

THERMOSTATS—

W. R. Ostrander & Co., 22 Dey St., N. Y.

THIMBLES AND HOOKS—See Hooks and Thimbles.**THIMBLE SKEINS AND BOXES—See Skeins, Thimble, and Boxes.****THIMBLES, Rope—**

Covert Mfg. Co., West Troy, N. Y.
Williamsport Wire Rope Co., Williamsport, Pa.

THIMBLES, Stove Pipe—

S. Cheney & Son, Manlius, N. Y.

THREADERS, Bicycle Spoke—

Detrick & Harvey Machine Co., Baltimore.
Geometric Drill Co., New Haven, Ct.
Goodell-Pratt Co., Greenfield, Mass.
E. J. Manville Machine Co., Waterbury, Ct.
Rudolph & Krummel, Chicago, Ill.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.
Webster & Perks Tool Co., Springfield, O.

THREADERS, Bolt—

Acme Machinery Co., Cleveland, O.
Automatic Machine Co., Bridgeport, Ct.
Asa S. Cook Co., Hartford, Ct.
Detrick & Harvey Machine Co., Baltimore.
E. J. Manville Machine Co., Waterbury, Ct.
National Machinery Co., Tiffin, O.
Niles Tool Works Co., Hamilton, O.
Webster & Perks Tool Co., Springfield, O.

THREADERS, Lag Screw—

Baker Bros., Toledo, O.
Asa S. Cook Co., Hartford, Ct.

THREADING AND CUTTING MACHINES, PIPE—See Pipe Cutting and Threading Machines.**THREADING MACHINES, Lag and Coach Screw—**

Baker Bros., Toledo, O.

THREADING TOOLS—See Tools, Threading.**THREAD ROLLING MACHINES, Screw—**

Blake & Johnson, Waterbury, Ct.
Cross & Speirs Machine Co., Waterbury, Ct.
E. J. Manville Machine Co., Waterbury, Ct.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

THRESHING MACHINES—

Orangeville Agricultural Works & Foundry, Orangeville, Pa.

THRESHING MACHINE TEETH—See Teeth, Threshing machine.**THROWING SHOT—**

Sam'l C. Tatum Co., Cincinnati, O.

THUMB KNOBS AND PLATES—See Knobs, Thumb, and Plates.**THUMB NUT AND SCREW BLANKS—See Blanks.****THUMB NUTS, SCREWS—See Nuts, Screws.****TICKET DATING STAMPS—See Stamps, Dating Railroad Ticket.**

TICKET HOOKS, PUNCHES—See Hooks, Punches.**TICKLERS, Office—**

Globe-Wernicke Co., Cincinnati, O.

TIE RODS—See Rods, Tie.**TIES, Bale—**

W. J. Adam, Joliet, Ill.
 American Steel & Wire Co., Chicago, Ill.
 American Steel Hoop Co., Pittsburgh, Pa.
 Dillon-Griswold Wire Co., Sterling, Ill.
 Kilmer Wire Mfg. Co., Chicago, Ill.
 Malin & Co., Cleveland, O.
 H. P. & H. F. Wilson, 577-579 Tenth Ave., New York.

TIES, Cattle—

Bridgeport Chain Co., Bridgeport, Ct.
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Works, Farmer, N. Y.
 Garland Chain Co., Rankin Station, Pa.
 Onelda Community, Niagara Falls, N. Y.
 John C. Schmidt & Co., York, Pa.

TIES, Cotton—

American Steel Hoop Co., Pittsburgh, Pa.
 Consolidated Iron & Steel Co., Bristol, Ct.
 Illinois Steel Co., Chicago, Ill.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

TIES, Steel Railroad—

Atlas Bolt & Screw Co., Cleveland, O.

TIES, Wall—

Cleveland Wire Spring Co., Cleveland, O.

TIGHTENERS, BELT—See Belt Tighteners.**TILE MACHINERY—**

F. R. Patch Mfg. Co., Rutland, Vt.

TILES—

Merchant & Co., Philadelphia, Pa.
 Murdock Parlor Grate Co., Boston, Mass.
 Chas. Taylor's Sons Co., Cincinnati, O.

TILING OR DITCHING SHOVELS—See Shovels, Tiling or Ditching.**TILING, Steel Floor—**

Wilmot & Hobbs Mfg. Co., Bridgeport, Ct.

TILLS, Alarm—

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

TIMBALE IRONS—See Irons, Timbale.**TIMBER DOGS, SCRIBES, STIRRUPS, &c.—See Dogs, Scribes, Stirrups, &c.****TIMBER DOLLIES—**

Boston & Lockport Block Co., Boston.
 J. R. Clark Co., Minneapolis, Minn.
 Peter Gerlach & Co., Cleveland, O.
 Kilbourne & Jacobs Mfg. Co., Columbus, O.

TIME CHECKS, LOCKS—See Checks, Locks.**TIN—**

American Metal Co., 80 Wall St., N. Y.
 John Davol & Sons, 100 John St., N. Y.
 Hendricks Bros., 49 Cliff St., New York.
 Theo. Hertz & Son, St. Louis, Mo.
 Theodore Hofeller & Co., Buffalo, N. Y.
 Lewisohn Bros., 81-83 Fulton St., N. Y.
 Merchant & Co., Philadelphia, Pa.
 Arthur T. Rutter, 256 Broadway, N. Y.
 J. J. Ryan & Co., Chicago, Ill.

TIN BOXES, PAILS, &c.—See Boxes, Pails, &c.**TINCTURE PRESSES—See Presses, Tincture.****TIN FOIL ROLLING MILLS—**

Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

TINNERS' AND PLUMBERS' FURNACES—See Furnaces, Plumbers' and Tanners'.**TINNERS' RULES, SHEARS, SNIPS, STAKES—See Rules, Shears, Snips, Stakes.****TINNERS' TOOLS AND MACHINES—**

Garry Iron & Steel Roofing Co., Cleveland, O.
 Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

TINNERS' TRIMMINGS—

Adams Co., Dubuque, Ia.
 Arcade Mfg. Co., Freeport, Ill.
 Berger Bros., Philadelphia, Pa.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 E. Phillips & Son, South Hanover, Mass.
 Pleuger & Henger Mfg. Co., St. Louis, Mo.
 Sidney Shepard & Co., Buffalo, N. Y.
 Stover Mfg. Co., Freeport, Ill.
 Stowell Mfg. & Foundry Co., South Milwaukee, Wis.

TINNING—

Albany Foundry Co., Albany, N. Y.
 Avery Stamping Co., Cleveland, O.
 Logan & Strobbridge Iron Co., New Brighton, Pa.
 Sidney Shepard & Co., Buffalo, N. Y.

TIN, Phosphor—

Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Neumann, 518 Pearl St., N. Y.
 J. J. Ryan & Co., Chicago, Ill.

TIN PLATE—See Plate, Tin and Terne.**TIN PLATE BARS—See Bars, Tin Plate.****TIN PLATE MACHINERY—**

Lloyd Booth Co., Youngstown, O.
 Frank-Kneeland Machine Co., Pittsburgh.
 Mesta Machine Co., Pittsburgh, Pa.
 F. R. Phillips' Sons Co., Philadelphia, Pa.
 R. Poole & Son Co., Baltimore, Md.
 Wm. Swindell & Bro., Pittsburgh, Pa.
 Totten & Hogg Iron & Steel Foundry Co., Pittsburgh, Pa.
 Wals & Roos Punch & Shear Co., Cincinnati, O.

TINS, Pie and Cake—

Keen & Hagerty Mfg. Co., Baltimore, Md.
 M. Schrayers' Sons & Co., Chicago, Ill.
 Sidney Shepard & Co., Buffalo, N. Y.

TINWARE, Japanned—

Keen & Hagerty Mfg. Co., Baltimore, Md.
 Seavey Mfg. Co., Boston, Mass.
 Sidney Shepard & Co., Buffalo, N. Y.

TINWARE, Pieced and Stamped—

Keen & Hagerty Mfg. Co., Baltimore, Md.
 M. Schrayers' Sons & Co., Chicago, Ill.
 Seavey Mfg. Co., Boston, Mass.
 Sidney Shepard & Co., Buffalo, N. Y.

TIPPLES, Coal—

Aultman Co., Canton, O.
 Jeffrey Mfg. Co., Columbus, O.

TIPS AND FENDERS, Rubber—

H. O. Canfield, Bridgeport, Ct.

TIPS, Gas, Lava—

D. M. Steward Mfg. Co., Chattanooga, Tenn.

TIPS, OR SOCKETS, Shaft, Yoke, Pole and Whiffletree—

Covert's Saddlery Works, Farmer, N. Y.
 Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

TIRE BENDERS, BOLTS, &c.—See Benders, Bolts, &c.**TIRE REPAIR OUTFITS AND SUPPLIES—**

Scovill Mfg. Co., Waterbury, Ct.

TIRES, Bicycle—

Morgan & Wright, Chicago, Ill.

TIRES, Railroad—

Latrobe Steel Co., Philadelphia, Pa.
 Wm. H. Wallace & Co., 66 Broadway, N. Y.

TOASTERS—

Gas Stove Utensil Co., 73 Murray St., N. Y.
 Fred. J. Meyers Mfg. Co., Hamilton, O.
 Schneider & Trenkamp Co., Cleveland, O.
 N. R. Streeter & Co., Rochester, N. Y.
 See also Kitchen Articles, Wire.

TOBACCO BOXES, CUTTERS, &c.—See Boxes, Cutters, &c.**TOE CALKS, CLIPS—See Calks, Clips.****TOE CALK STEEL—See Steel, Toe Calk.****TOILET CLIPPERS—See Clippers, Horse and Toilet.****TOKENS—**

American Railway Supply Co., 24 Park Place, New York.

TOMATO GUARDS—See Guards, Flower and Tomato.**TONGS—See Shovels, Tongs, Pokers, Fire Sets, &c.****TONGS, Blacksmiths—**

Heller Bros. Co., Newark, N. J.
 Wheeling Hinge Co., Wheeling, W. Va.

TONGS, Carbon—

Billings & Spencer Co., Hartford, Ct.

TONGS, Coal—

Logan & Strobbridge Iron Co., New Brighton, Pa.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

TONGS, Crucible—

Byram & Co., Detroit, Mich.

TONGS, Fish—

Nicol & Co., Chicago, Ill.

TONGS, Ice—

Peter Gerlach & Co., Cleveland, O.
 Louden Machinery Co., Fairfield, Ia.
 Palmer Hardware Mfg. Co., Troy, N. Y.
 N. R. Streeter & Co., Rochester, N. Y.
 W. T. Wood & Co., Arlington, Mass.

TONGS, Pipe—

Hollands Mfg. Co., Erie, Pa.
 Jarecki Mfg. Co., Erie, Pa.
 D. Saunders' Sons, Yonkers, N. Y.

TONGS, Pipe Hanger—

Berger Bros., Philadelphia, Pa.

TONGS, Roofing—

Niagara Machine & Tool Works, Buffalo.
 Peck, Stow & Wilcox Co., 27 Murray St., New York.

TONGS, Skidding—

Peter Gerlach & Co., Cleveland, O.

TOOL BOXES, CHESTS, GRINDERS, HOLDERS—See Boxes, Chests, Grinders, Holders.**TOOL MAKERS' CLAMPS—See Clamps, Tool Makers'.****TOOLS AND SUPPLIES, Factory, Railway, &c., Dealers in—**

General Supply Co., 40 John St., N. Y.

TOOLS, Automatic Boring—

Millers Falls Co., 28 Warren St., N. Y.

TOOLS, Bell Centering—

Braunsdorf-Mueller Co., Elizabeth, N. J.

TOOLS, BOILER MAKERS', BUTCHER, &c.—See Boiler Makers', Butcher, &c.**TOOLS, BORING—See Boring Tools.****TOOLS, Brass Working—**

American Tool Works Co., Cincinnati, O.
 Niles Tool Works Co., Hamilton, O.

TOOLS, COMPRESSED AIR—See Compressed Air Tools.**TOOLS, Diamond Pointed—**

Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
 Thos. L. Dickinson, 45 Vesey St., N. Y.
 Mendes Cutting Factories, 14 John St., New York.
 Sterling Emery Wheel Mfg. Co., Tiffin, O.
 Tanite Co., Stroudsburg, Pa.

TOOLS, Dowels, Pins, &c.—

Chandler & Farquhar, Boston, Mass.

TOOL SETS—See Sets, Screw Driver and Tool.**TOOL SETS, GARDEN—See Sets, Garden Tool.****TOOL SETS, HOLLOW HANDLE—See Sets, Tool, Hollow Handle.****TOOLS, Filers' (Cleaners, Handles, Holders, &c.)—**

Nicholson File Co., Providence, R. I.

TOOLS, Jewelers' and Tool Makers'—

Nicholson File Co., Providence, R. I.

TOOLS, Lumber—

Morley Bros., Saginaw, Mich.

TOOLS, Parting—

Tuck Mfg. Co., Brockton, Mass.

TOOLS, Pneumatic—Clayton Air Compressor Works, 26 Cortland St., New York.
Philadelphia Pneumatic Tool Co., Philadelphia, Pa.**TOOLS, Reloading, Cartridge—**

Ideal Mfg. Co., New Haven, Ct.

TOOLS, Saw Makers'—E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.**TOOLS, Ship Carpenters'—**

L. & I. J. White Co., Buffalo, N. Y.

TOOLS, Slaters'—Belden Machine Co., New Haven, Ct.
Niagara Machine & Tool Works, Buffalo, N. Y.**TOOL STEEL BALLS—See Balls, Steel.****TOOLS, Thread Cutting Lathe—**Billings & Spencer Co., Hartford, Ct.
Pratt & Whitney Co., Hartford, Ct.**TOOLS, Threading—**J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.**TOOLS, WELL—See Well Supplies and Tools.****TOOLS, Wood Turners'—**Braunsdorf-Mueller Co., Elizabeth, N. J.
Buck Bros., Milbury, Mass.**TOP BRACES AND RAILS—See Braces and Rails, Top.****TOP PROP BLOCKS—See Blocks, Top Prop.****TOPS, Chimney Revolving—**Clark, Quilen & Morse, Peoria, Ill.
Kanneberg Roofing Co., Canton, O.**TORCHES, Gasoline and Oil—**Bridgeport Brass Co., Bridgeport, Ct.
Gem Mfg. Co., Pittsburgh, Pa.
Hollands Mfg. Co., Erie, Pa.
Keen & Hagerty Mfg. Co., Baltimore, Md.
J. W. Paxson Co., Philadelphia, Pa.
Schneider & Trenkamp Co., Cleveland, O.**TORSION TESTING MACHINES—See Testing Machines, Torsion.****TOTE BOXES—See Boxes, Tote.****TOWEL HOLDERS, ROLLERS—See Holders, Rollers.****TOWERS, COOLING—See Cooling Towers.****TOWERS, Tank—**J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Flint & Walling Mfg. Co., Kendallville, Ind.
Lee-Odum Boiler Co., Memphis, Tenn.
Wm. B. Scaife & Sons, Pittsburgh, Pa.
Stover Mfg. Co., Freeport, Ill.
Warren City Boiler Works, Warren, O.**TOY BANKS—See Toy Savings Banks.****TOY BATH TUBS—**

Logan & Strobbridge Iron Co., New Brighton, Pa.

TOY BEDS—

Arcade Mfg. Co., Freeport, Ill.

TOY BELLS—

N. N. Hill Brass Co., East Hampton, Ct.

TOY BRACES—

Mason & Parker, Winchenden, Mass.

TOY CHISELS—

New England Specialty Co., North Easton, Mass.

TOY COFFEE MILLS—

Arcade Mfg. Co., Freeport, Ill.

TOY FIRE SETS—

Logan & Strobbridge Iron Co., New Brighton, Pa.

TOY HAMMERS—

Wrightsville Hardware Co., Wrightsville, Pa.

TOY HATCHETS—Arcade Mfg. Co., Freeport, Ill.
Wrightsville Hardware Co., Wrightsville, Pa.**TOY HOLLOW WARE—**

Logan & Strobbridge Iron Co., New Brighton, Pa.

TOY JACK STONES—Arcade Mfg. Co., Freeport, Ill.
Wrightsville Hardware Co., Wrightsville, Pa.**TOY LAWN MOWERS—**Arcade Mfg. Co., Freeport, Ill.
Crescent Brass & Iron Co., Detroit, Mich.**TOY PINCERS—**

Wrightsville Hardware Co., Wrightsville, Pa.

TOY PLANE IRONS—

New England Specialty Co., North Easton, Mass.

TOY PUMPS—

Arcade Mfg. Co., Freeport, Ill.

TOY SAD IRONS—Arcade Mfg. Co., Freeport, Ill.
Nicol & Co., Chicago, Ill.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
A. C. Williams, Ravenna, O.
Wrightsville Hardware Co., Wrightsville, Pa.**TOY SAVINGS BANKS—**Arcade Mfg. Co., Freeport, Ill.
Crescent Brass & Iron Co., Detroit, Mich.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Mason & Parker, Winchenden, Mass.
Nicol & Co., Chicago, Ill.
Reading Hardware Co., Reading, Pa.**TOY SCALES—**Arcade Mfg. Co., Freeport, Ill.
Logan & Strobbridge Iron Co., New Brighton, Pa.**TOY SHOVELS—**

Wrightsville Hardware Co., Wrightsville, Pa.

TOY STOVES—

Arcade Mfg. Co., Freeport, Ill.

TOY SWINGS—

Arcade Mfg. Co., Freeport, Ill.

TOY TOOLS—Arcade Mfg. Co., Freeport, Ill.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Mason & Parker, Winchenden, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.**TOYS, Iron and Steel—**Arcade Mfg. Co., Freeport, Ill.
Coleman Hardware Co., Chicago, Ill.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Mason & Parker, Winchenden, Mass.
Wrightsville Hardware Co., Wrightsville, Pa.**TRACE BUCKLES, CHAINS—See Buckles, Chains.****TRACING WHEELS—See Wheels, Tracing.****TRACK BOLTS, CHISELS, GAUGES—See Bolts, Chisels, Gauges.****TRACK, Overhead Carrying—**Atlas Bolt & Screw Co., Cleveland, O.
Colum Trolley Track Mfg. Co., Holyoke, Mass.
Janesville Hay Tool Co., Janesville, Wis.
Louden Machinery Co., Fairfield, Ia.
F. E. Myers & Bro., Ashland, O.**TRAMMELS AND TRAMMEL POINTS—**Athol Machine Co., Athol, Mass.
Henry Disston & Sons, Philadelphia, Pa.
J. W. Paxson Co., Philadelphia, Pa.
Stanley Rule & Level Co., New Britain, Ct.
L. S. Starrett Co., Athol, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
T. F. Welch Mfg. Co., Boston, Mass.**TRAMWAYS, Overhead—**Ed. Harrington, Son & Co., Philadelphia.
Reading Crane & Hoist Works, Reading, Pa.
J. G. Spiedel, Reading, Pa.
Whiting Foundry Equipment Co., Harvey, Ill.**TRAMWAYS, Wire Rope—**California Wire Works, San Francisco, Cal.
A. Leschen & Sons Rope Co., St. Louis, Mo.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
Treutoh Iron Co., Trenton, N. J.**TRANSFER TABLES, Locomotive—**

Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

TRANSFORMERS, Electric—Eddy Electric Mfg. Co., Windsor, Ct.
General Electric Co., Schenectady, N. Y.**TRANSITS—**

L. S. Starrett Co., Athol, Mass.

TRANSMISSION MACHINERY, Electric Power—Eddy Electric Mfg. Co., Windsor, Ct.
General Electric Co., Schenectady, N. Y.**TRANSMISSION, ROPE—See Rope Transmission.****TRANSOM CATCHES, CENTERS, LIFTERS—See Catches, Centers, Lifters.****TRANSPLANTERS—**

Iowa Farming Tool Co., Fort Madison, Ia.

TRAP DOOR HINGES—See Hinges, Trap Door.**TRAPS, Fish—**

Fred. J. Meyers Mfg. Co., Hamilton, O.

TRAPS, Fly—Estey Wire Works Co., 65 Fulton St., N. Y.
Fred J. Meyers Mfg. Co., Hamilton, O.
Sidney Shepard & Co., Buffalo, N. Y.**TRAPS, Game—**Hawkins Co., Waterbury, Ct.
Onelda Community, Niagara Falls, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.**TRAPS, Mole—**Atwater Mfg. Co., Southington, Ct.
Enterprise Mfg. Co., Philadelphia, Pa.**TRAPS, Rat and Mouse—**Burditt & Williams, Boston, Mass.
Edward Darby & Sons, Philadelphia, Pa.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Nelson Lyon, Albany, N. Y.
Scheeler's Sons, Buffalo, N. Y.
Smith & Egge Mfg. Co., Bridgeport, Ct.
N. R. Streeter & Co., Rochester, N. Y.
Wire Goods Co., Worcester, Mass.**TRAPS, Sewer—**

Barnes Mfg. Co., Mansfield, O.

TRAPS, Steam—American Blower Co., Detroit, Mich.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Fairbanks Co., 311 Broadway, New York.
Harrison Safety Boiler Works, Philadelphia, Pa.
Heat Transmission Co., Danbury, Ct.
Jenkins Bros., 71 John St., New York.
Mason Regulator Co., Boston, Mass.
B. F. Sturtevant Co., Boston, Mass.**TRAPS, Stench—**John C. Kupferle, St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.**TRAP WRENCHES—See Wrenches, Trap.****TRAVELERS, Boom and Deck—**

W. & J. Tiebout, 118 Chambers St., N. Y.

TRAYS, Card, Children's, Crumb, Spoon, &c., Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

TRAYS, Knife—

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

TRAYS, Metal—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Rome Mfg. Co., Rome, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.

TRAYS, Soap—

Logan & Strobridge Iron Co., New Brighton, Pa.

TRAYS, Wire Paper—

Wire Goods Co., Worcester, Mass.

TREADS, Stair, Rubber—

Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg. Co., 16 Warren St., New York.

TREE GUARDS, LABELS—See Guards, Labels.**TRELLISES, Wire—**

E. T. Barnum, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Howard & Morse, 45 Fulton St., New York.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Scheeler's Sons, Buffalo, N. Y.
W. S. Tyler Co., Cleveland, O.

TRESSELS, Painters'—

J. R. Clark Co., Minneapolis, Minn.

TREVOTS—

Logan & Strobridge Iron Co., New Brighton, Pa.

TRIANGLE RINGS—See Rings, Triangle.**TRIANGLES, Steel—**

Brown & Sharpe Mfg. Co., Providence, R. I.
Henry Disston & Sons, Philadelphia, Pa.

TRIERS, Butter and Cheese—

American Cutlery Co., Chicago, Ill.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

TRIMMERS, Bolt Head—

National Machinery Co., Tiffin, O.

TRIMMERS, Lamp—

Acme Shear Co., Bridgeport, Ct.
Bridgeport Brass Co., Bridgeport, Ct.

TRIMMERS, Photograph—

S. G. Monce, Unionville, Ct.

TRIMMERS, Spoke—

American Machinery Co., Grand Rapids, Mich.
Defiance Machine Works, Defiance, O.
C. E. Jennings Co., 101 Reade St., N. Y.
Millers Falls Co., 28 Warren St., N. Y.

TRIMMERS' TACKS—See Tacks, Trimmers'.**TRIMMERS, Wood—**

Fox Machine Co., Grand Rapids, Mich.

TRIMMINGS, Bag, Box, &c.—

R. C. Jenkins & Co., Newark, N. J.

TRIMMINGS, Car, Brass—

Pleuger & Henger Mfg. Co., St. Louis, Mo.

TRIMMINGS, Lamp—

Edward Miller & Co., Meriden, Ct.

TRIMMINGS, Shaft Leather—

McKinnon Dash Co., Buffalo, N. Y.

TRIMMINGS, Stove—

Davis & Burton Stamping Co., Worcester, Mass.
Logan & Strobridge Iron Co., New Brighton, Pa.
Troy Nickel Works, Albany, N. Y.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

TRIMMINGS, TINNERS—See Tinnings' Trimmings.**TROLLEY CARRIAGES, INSULATORS—See Carriages, Insulators.****TROLLEY HOISTS—See Hoists, Trolley.****TROLLEY MATERIALS, Electrical—**

Hillings & Spencer Co., Hartford, Ct.
Keystone Drop Forge Co., Philadelphia.

TROLLEY POLES, SPRINGS—See Poles, Springs.**TROLLEYS, Pneumatic—**

Pneumatic Crane Co., Pittsburgh, Pa.

TROLLEYS, Street Railway—

Atlas Bolt & Screw Co., Cleveland, O.
R. D. Nuttall Co., Allegheny, Pa.

TROLLEY WIRE—See Wires, Electrical.**TROUGHS, Cattle—**

Avery Stamping Co., Cleveland, O.
West Side Foundry Co., Troy, N. Y.

TROUGHS, Conveyor—

Heyl & Patterson, Pittsburgh, Pa.
Link-Belt Engineering Co., Philadelphia.

TROUSER GUARDS, HANGERS, STRETCHERS—See Guards, Hangers, Stretchers.**TROWELS, Brick, Plastering, &c.—**

E. C. Atkins & Co., Indianapolis, Ind.
Geo. H. Bishop & Co., Cincinnati, O.
Henry Disston & Sons, Philadelphia, Pa.
National Saw Co., Newark, N. J.

TROWELS, Garden—

Avery Stamping Co., Cleveland, O.
Chantrell Tool Co., Reading, Pa.
W. J. Clark Co., Salem, O.
Logan & Strobridge Iron Co., New Brighton, Pa.
F. E. Kohler & Co., Canton, O.
New York Stamping Co., Brooklyn, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., New York.

TRUCK CASTERS, WHEELS—See Casters, Wheels.**TRUCKS, Bag—**

Kilbourne & Jacobs Mfg. Co., Columbus, O.
Lansing Wheelbarrow Co., Lansing, Mich.

TRUCKS, Barrel—

Adams Co., Dubuque, Ia.
Boston & Lockport Block Co., Boston.
Fairbanks Co., 311 Broadway, New York.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
McKinney Mfg. Co., Allegheny, Pa.
Syracuse Chilled Plow Co., Syracuse, N. Y.
Tucker & Dorsey Mfg. Co., Indianapolis.
R. W. Whitehurst & Co., Norfolk, Va.

TRUCKS, Barrel and Stand—

Atlas Bolt & Screw Co., Cleveland, O.
Boston & Lockport Block Co., Boston.
Enterprise Mfg. Co., Philadelphia, Pa.

TRUCKS, Basket—

Kilbourne & Jacobs Mfg. Co., Columbus, O.
R. W. Whitehurst & Co., Norfolk, Va.

TRUCKS, Brick—

Atlas Bolt & Screw Co., Cleveland, O.
Wm. Bayley & Sons Co., Milwaukee, Wis.
Kilbourne & Jacobs Mfg. Co., Columbus, O.

TRUCKS, Dry Kiln—

American Blower Co., Detroit, Mich.
Atlas Bolt & Screw Co., Cleveland, O.

TRUCKS, Foundry—

Atlas Bolt & Screw Co., Cleveland, O.
Boston & Lockport Block Co., Boston.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Northern Engineering Works, Detroit, Mich.
J. W. Paxson Co., Philadelphia, Pa.
Variety Machine Co., Warsaw, N. Y.
R. W. Whitehurst & Co., Norfolk, Va.
Whiting Foundry Equipment Co., Harvey, Ill.

TRUCKS, Stationers'—

Sam'l C. Tatum Co., Cincinnati, O.

TRUCKS, Steel Farm—

Havana Metal Wheel Co., Havana, Ill.

TRUCKS, Store, Warehouse, &c.—

Atlas Bolt & Screw Co., Cleveland, O.
Boston & Lockport Block Co., Boston.
Buffalo Scale Co., Buffalo, N. Y.
Fairbanks Co., 311 Broadway, New York.
Havana Metal Wheel Co., Havana, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
McKinney Mfg. Co., Allegheny, Pa.
Sidney Steel Scraper Co., Sidney, O.
Syracuse Chilled Plow Co., Syracuse, N. Y.
Tucker & Dorsey Mfg. Co., Indianapolis.
Variety Machine Co., Warsaw, N. Y.
R. W. Whitehurst & Co., Norfolk, Va.
Wire Goods Co., Worcester, Mass.

TRUCKS, Stove—

Arcade Mfg. Co., Freeport, Ill.
Barnes Mfg. Co., Mansfield, O.
Fairbanks Co., 311 Broadway, New York.
S. M. Howes Co., Boston, Mass.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
C. S. Mersick & Co., New Haven, Ct.
Tucker & Dorsey Mfg. Co., Indianapolis.
R. W. Whitehurst & Co., Norfolk, Va.

TRUCKS, Street Car—

Lorain Steel Co., Lorain, O.

TRUCKS, Timber—

E. C. Atkins & Co., Indianapolis, Ind.
Atlas Bolt & Screw Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
B. F. Sturtevant Co., Boston, Mass.

TRUCKS, Tin Plate—

Atlas Bolt & Screw Co., Cleveland, O.

TRUCKS, Wire—

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

TRUCK WHEEL COVERS, RUBBER—See Covers, Truck Wheel, Rubber.**TRUMPETS, Firemen's, Silver Plated—**

International Silver Co., 9-13 Maiden Lane, New York.

TRUNK CARRIERS, CLAMPS, &c.—See Carriers, Clamps, &c.**TRUSS RODS—See Rods, Roof, &c.****TRY SQUARES—See Squares, Try.****T-SQUARES—See Drawing Tools.****TUB EARS, HANDLES, HOOPS—See Ears, Handles, Hoops.****TUBE CUTTERS, EXPANDERS, &c.—See Cutters, Expanders, &c.****TUBE HOLE PUNCHES—See Punches, Hand and Tube Hole.****TUBE REDUCING MACHINES—**

Mossberg & Granville Mfg. Co., Providence, R. I.

TUBES, Boiler—

Heckert-Baltzley Billet Co., Toledo, O.
National Tube Co., Pittsburgh, Pa.
Pierson & Co., 29 Broadway, New York.
Shelby Steel Tube Co., Shelby, O.
Statler-Bischoff Co., Chicago, Ill.
Wm. H. Wallace & Co., 66 Broadway, New York.

TUBES, Brass Condenser—

Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.

TUBES, Glass—

Ashton Valve Co., Boston, Mass.

TUBES, Grain Drill—

Boston Belting Co., Boston, Mass.

TUBES, Hydraulic Seamless, Steel—

Shelby Steel Tube Co., Cleveland, O.

TUBES, Indented Copper—

Heat Transmission Co., Danbury, Ct.

TUBES, Speaking—

Berger Bros., Philadelphia, Pa.
Merchant & Co., Philadelphia, Pa.
W. R. Ostrander & Co., 22 Dey St., N. Y.

TUBING, Aluminum—

Pittsburgh Reduction Co., Pittsburgh, Pa.

TUBING, Atomizer—

Wm. S. Spofford & Son, Providence, R. I.

TUBING, Bicycle—

John S. Leng's Son & Co., 4 Fletcher St., New York.
National Tube Co., Pittsburgh, Pa.
Shelby Steel Tube Co., Cleveland, O.
Statler-Bischoff Co., Chicago, Ill.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

TUBING, Brass and Copper—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Merchant & Co., Philadelphia, Pa.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.
Wm. S. Spofford & Son, Providence, R. I.
E. H. Stroud & Co., Chicago, Ill.
Waterbury Brass Co., Waterbury, Ct.
Wilnot & Hobbs Mfg. Co., Bridgeport, Ct.

TUBING, Bronze—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Merchant & Co., Philadelphia, Pa.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.

TUBING, German Silver—

Randolph-Clowes Co., Waterbury, Ct.
 Scovill Mfg. Co., Waterbury, Ct.
 Wm. S. Spofford & Son, Providence, R. I.

TUBING, Hydraulic Seamless Steel—

National Tube Co., Pittsburgh, Pa.

TUBING, Iron Lined, Brass and Bronze—

Phoenix Tube Co., Brooklyn, N. Y.
 Statler-Bischoff Co., Chicago, Ill.

TUBING, Nickel Steel—

Heckert-Baltzley Billet Co., Toledo, O.

TUBING, Rubber—

Boston Belting Co., Boston, Mass.
 H. O. Canfield, Bridgeport, Ct.
 Peerless Rubber Mfg. Co., 16 Warren St., New York.

TUBING, Seamless, Plants for—

Hugh L. Thompson, Waterbury, Ct.

TUBING, Seamless Steel—

Heckert-Baltzley Billet Co., Toledo, O.
 Janney, Steinmetz & Co., Philadelphia, Pa.
 John S. Leng's Son & Co., 4 Fletcher St., New York.
 National Tube Co., Pittsburgh, Pa.
 Shelby Steel Tube Co., Shelby, O.

TUBING, Silver—

Randolph-Clowes Co., Waterbury, Ct.

TUBING, Well—

National Tube Co., Pittsburgh, Pa.
 Statler-Bischoff Co., Chicago, Ill.

TUBING, Zinc—

Bridgeport Brass Co., Bridgeport, Ct.
 Scovill Mfg. Co., Waterbury, Ct.
 Waterbury Brass Co., Waterbury, Ct.

TUBS, BATH—See Bathtubs.**TUBS, Crockery, Laundry—**

Humphries Mfg. Co., Mansfield, O.

TUBS, Factory—

W. J. Clark Co., Salem, O.

TUBS, Hoisting—

W. J. Clark Co., Salem, O.
 Heyl & Patterson, Pittsburgh, Pa.
 C. W. Hunt Co., West New Brighton, N. Y.
 Jeffrey Mfg. Co., Columbus, O.
 Littleford Bros., Cincinnati, O.

TUBS, Masons—

Portland Ladder Co., Newark, N. J.

TUBS, Milk—

V. Clad & Sons, Philadelphia, Pa.

TUMBLING MILLS—

Byram & Co., Detroit, Mich.
 Northern Engineering Works, Detroit, Mich.
 J. W. Paxson Co., Philadelphia, Pa.
 Whiting Foundry Equipment Co., Harvey, Ill.

TUNGSTEN, Nickel—

Geo. G. Blackwell, Sons & Co., Liverpool, England.

TURBINE WATER WHEELS—See Water Wheels.**TUREENS, Silver Plated—**

International Silver Co., 9-13 Malden Lane, New York.

TURF EDGERS—See Edgers, Turf.**TURNBUCKLES—**

American Iron & Steel Mfg. Co., Lebanon, Pa.
 Berger Bros., Philadelphia, Pa.
 Cleveland City Forge & Iron Co., Cleveland.
 W. H. Haskell Mfg. Co., Pawtucket, R. I.
 A. Leschen & Sons Rope Co., St. Louis, Mo.
 Merrill Bros., Brooklyn, N. Y.
 Pierson & Co., 29 Broadway, New York.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Republic Iron & Steel Co., Chicago, Ill.
 Rhode Island Tool Co., Providence, R. I.
 Rockford Bolt Works, Rockford, Ill.
 Strieby & Foote Co., Newark, N. J.
 W. & J. Tiebout, 118 Chambers St., N. Y.
 T. F. Welch Mfg. Co., Boston, Mass.
 Williamsport Wire Rope Co., Williamsport, Pa.

TURNBUCKLE TAPPING MACHINES—

See Tapping Machines, Turnbuckle.

TURNERS, Cake—

Arcade Mfg. Co., Freeport, Ill.
 Keen & Hagerty Mfg. Co., Baltimore, Md.
 Sidney Shepard & Co., Buffalo, N. Y.

TURNING AND BORING MILLS—See Mills, Boring and Turning.**TURNING AND FELLOE WEBS—See Webs, Turning, Felloe, &c.****TURNING MACHINES, Cylinder Head—**

Grant Machine Tool Works, Cleveland, O.

TURNINGS, WOOD, to Order—

Union Hardware Co., Torrington, Ct.

URNS, Cupboard—

Peck, Stow & Wilcox Co., 27 Murray St., New York.
 Reading Hardware Co., Reading, Pa.
 Russell & Erwin Mfg. Co., 43-47 Chambers St., New York.

TURN TABLES, Bridge and Railroad—

Berlin Iron Bridge Co., East Berlin, Ct.
 Thos. Carlin's Sons, Allegheny, Pa.
 Link-Belt Engineering Co., Philadelphia.
 New England Structural Co., Boston, Mass.
 Passaic Rolling Mill Co., Paterson, N. J.
 A. & P. Roberts Co., Philadelphia, Pa.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.
 Trenton Iron Co., Trenton, N. J.
 Whiting Foundry Equipment Co., Harvey, Ill.

TURN TABLES, Mine—

Northern Engineering Works, Detroit, Mich.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

TURN TABLES, Shop—

Northern Engineering Works, Detroit, Mich.
 Wm. Sellers & Co. (Inc.), Philadelphia, Pa.

TURRET DRILLS, LATHES—See Drills, Lathes.**TUYERE IRONS—See Irons, Tuyere.****TUYERES, Bronze—**

Phosphor-Bronze Smelting Co., Philadelphia, Pa.

TWINE, Binder—

American Mfg. Co., 65 Wall St., New York.
 Waterbury Rope Co., 69 South St., N. Y.

TWINE BOXES, HOLDERS—See Boxes, Holders.**TWINE MACHINERY—**

Hoover & Gamble Co., Miamisburg, O.

TWIST DRILL GRINDING MACHINES—See Drill Grinding Machines, Twist.**TWIST DRILLS—See Drills, Twist.****TWISTING MACHINES, Wire—**

Bates Machine Co., Joliet, Ill.

TYPE SETTING MACHINES—

R. H. Brown & Co., New Haven, Ct.

TYPEWRITERS—

Fox Machine Co., Grand Rapids, Mich.

UMBRELLA STANDS, &c.—See Stands, &c.**UNDERWRITERS' WIRE—See Wires, Electrical.****UNIFORM BUTTONS—See Buttons, Uniform.****UNION SCALES—See Scales, Union.****UNIONS, Forged—**

J. H. Williams & Co., Brooklyn, N. Y.

UNIONS, Pipe—

E. M. Dart, Providence, R. I.
 Nolte Brass Co., Springfield, O.

UNLOADERS, Railroad—

Lidgerwood Mfg. Co., 96 Liberty St., N. Y.

UPHOLSTERERS' AND SADDLERY HAMMERS—See Hammers, Saddlery and Upholsterers'.**UPHOLSTERERS' REGULATORS—See Regulators, Upholsterers'.****UPHOLSTERY AND CURTAIN FIXTURES—See Curtain and Upholstery Fixtures.****UPHOLSTERY HARDWARE—**

Turner & Seymour Mfg. Co., Torrington, Ct.

UPRIGHT PULLEYS—See Pulleys, Upright.**UPSETTERS, Tire—**

Buffalo Forge Co., Buffalo, N. Y.
 Fulton Iron & Engine Works, Detroit, Mich.

URNS, Tea, Coffee, &c.

V. Clad & Sons, Philadelphia, Pa.

VACUUM PUMPS—See Pumps, Compression and Vacuum.**VALLEYS AND GUTTERS, in Rolls—**

Garry Iron & Steel Roofing Co., Cleveland, O.

VALVE DISCS, ROD PACKING—See Discs, Packing.**VALVE FLOOR STANDS—**

Chapman Valve Mfg. Co., Boston, Mass.

VALVE REMODELING DEVICE—

Quincy Valve & Mfg. Co., Quincy, Ill.

VALVES, Ammonia—

Chapman Valve Mfg. Co., Boston, Mass.
 Crosby Steam Gage & Valve Co., Boston.
 Jarecki Mfg. Co., Erie, Pa.
 Jenkins Bros., 71 John St., New York.
 Kennedy Valve Mfg. Co., 58 Beekman St., New York.
 Manning, Maxwell & Moore, 85 Liberty St., New York.

VALVES, Balanced—

Kennedy Valve Mfg. Co., 58 Beekman St., New York.
 Mason Regulator Co., Boston, Mass.

VALVES, Bicycle—

Scovill Mfg. Co., Waterbury, Ct.

VALVES, Blow Off—

Standard Pneumatic Tool Co., Chicago, Ill.

VALVES, Check—

Jarecki Mfg. Co., Erie, Pa.
 Jenkins Bros., 71 John St., New York.
 Kennedy Valve Mfg. Co., 58 Beekman St., New York.
 Lunkenheimer Company, Cincinnati, O.
 McNab & Harlin Mfg. Co., 56 John St., New York.
 Nolte Brass Co., Springfield, O.

VALVES, Float—

Sandwich Enterprise Co., Sandwich, Ill.

VALVES, Gate—

Kennedy Valve Mfg. Co., 58 Beekman St., New York.
 Watson-Stillman Co., 204-210 East 43d St., New York.
 R. D. Wood & Co., Philadelphia, Pa.

VALVES, Lever—

Mason Regulator Co., Boston, Mass.

VALVES, PUMP—See Well Supplies and Tools.**VALVES, Radiator—**

Jarecki Mfg. Co., Erie, Pa.
 Jenkins Bros., 71 John St., New York.
 Kennedy Valve Mfg. Co., 58 Beekman St., New York.
 Lunkenheimer Company, Cincinnati, O.

VALVES, Reducing—

Fairbanks Co., 311 Broadway, New York.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 Mason Regulator Co., Boston, Mass.
 Watson-Stillman Co., 204-210 East 43d St., New York.

VALVES, Relief—

Ashton Valve Co., Boston, Mass.
 Crosby Steam Gage & Valve Co., Boston.
 Fairbanks Co., 311 Broadway, New York.
 Jarecki Mfg. Co., Erie, Pa.
 Lunkenheimer Company, Cincinnati, O.
 Manning, Maxwell & Moore, 85 Liberty St., New York.
 John H. McGowan & Co., Cincinnati, O.
 Watson-Stillman Co., 204-210 East 43d St., New York.

VALVES, Rubber—

Boston Belting Co., Boston, Mass.
H. O. Canfield, Bridgeport, Ct.
Crosby Steam Gage & Valve Co., Boston.
Peerless Rubber Mfg. Co. 16 Warren St.,
New York.

VALVES, Safety—

Ashton Valve Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston.
Fairbanks Co., 311 Broadway, New York.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 71 John St., New York.
Kennedy Valve Mfg. Co., 58 Beckman St.,
New York.
Lunkenheimer Company, Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St.,
New York.
McNab & Harlin Mfg. Co., 56 John St.,
New York.
Watson-Stillman Co., 204-210 East 43d St.,
New York.

VALVES, Snifting—

Ashton Valve Co., Boston, Mass.
Lunkenheimer Company, Cincinnati, O.

VALVE STEMS—

Finished Steel Co., Youngstown, O.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

VALVES, Vacuum Regulating—

Manning, Maxwell & Moore, 85 Liberty St.,
New York.
Mason Regulator Co., Boston, Mass.

VALVES, Water, Gas and Steam—

Ashton Valve Co., Boston, Mass.
Chapman Valve Mfg. Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston.
Hollands Mfg. Co., Erie, Pa.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 71 John St., New York.
Kennedy Valve Mfg. Co., 58 Beckman St.,
New York.
Lunkenheimer Company, Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St.,
New York.
McNab & Harlin Mfg. Co., 56 John St.,
Nolte Brass Co., Springfield, O.
Philadelphia Roll & Machine Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Foundry Co., Reading, Pa.
Watson-Stillman Co., 204-210 East 43d St.,
New York.
R. D. Wood & Co., Philadelphia, Pa.

VALVES, Water Reducing—

Jenkins Bros., 71 John St., New York.
Manning, Maxwell & Moore, 85 Liberty St.,
New York.
Mason Regulator Co., Boston, Mass.

VALVES, Water Relief—

Ashton Valve Co., Boston, Mass.
Crosby Steam Gage & Valve Co., Boston.
Lunkenheimer Company, Cincinnati, O.
Manning, Maxwell & Moore, 85 Liberty St.,
New York.
Mason Regulator Co., Boston, Mass.
McNab & Harlin Mfg. Co., 56 John St.,
N. Y.

**VALVE WHEELS. STEAM—See
Wheels, Steam Valve.****VANES, SHEET IRON—See Finials and
Vaness, Sheet Iron.****VANES, WEATHER—See Iron, Orna-
mental.****VAPOR LAMPS, GASOLINE—See
Lamps, Gasoline, Gas.****VARNISH CANS—See Cans, Paint and
Varnish.****VARNISH, House—**

Standard Varnish Works, 29 Broadway,
New York.

VARNISHING MACHINES—

Chambers Bros. Co., Philadelphia, Pa.

VASES, Coal—

Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

VASES, Decorated Metal—

Goodwin & Kintz Co., Winsted, Ct.

VASES, Lawn—

E. T. Barnum, Detroit, Mich.
Ellis & Halfenbarger, Indianapolis, Ind.
Ludlow-Saylor Wire Co., St. Louis, Mo.
F. J. Meyers Mfg. Co., Hamilton, O.
Stewart Iron Works, Cincinnati, O.
Van Dorn Iron Works Co., Cleveland, O.

VASES, Silver Plated—

International Silver Co., 9-13 Maiden
Lane, New York.

VATS, Freezing—

Lee-Odlum Boiler Co., Memphis, Tenn.

VAULTS, Fire and Burglar Proof.

Van Dorn Iron Works Co., Cleveland, O.

VEGETABLE AND MEAT CUTTERS—

See Cutters, Meat and Vegetable.

VEGETABLE BOILERS, WIRE—See

Kitchen Articles, Wire.

VEGETABLE MASHERS, PARERS, &c.

—See Mashers, Parers, &c.

VEHICLES, BUGGIES, CARRIAGES,

&c.—

Consolidated Railway Electric Lighting &
Equipment Co., Derby, Ct.
Eureka Co., Rock Falls, Ill.
Parry Mfg. Co., Indianapolis, Ind.

**VEHICLE WHEELS—See Wheels,
Vehicle.****VENEER CUTTERS—See Cutters, Ve-
neer.****VENEERING SAWS—See Saws, Seg-
ment or Veneering.****VENTILATING AND HEATING APPA-
RATUS—See Heating and Ventilat-
ing Apparatus.****VENTILATING SYSTEM, Balanced—**

E. A. Ormsby, Melrose, Mass.

**VENTILATOR CAPS, CORD—See Caps,
Cord.****VENTILATORS—See Registers and
Ventilators.****VENTILATORS AND CHIMNEY CAPS—**

G. Drouve Co., Bridgeport, Ct.
Garry Iron & Steel Roofing Co., Cleve-
land, O.
Hess, Snyder & Co., Massillon, O.
Osborn Mfg. Co., Cleveland, O.
Wiley & Russell Mfg. Co., Greenfield, Mass.

**VENTILATORS, Barn, &c. Sheet
Iron—**

Kanneberg Roofing Co., Canton, O.

VENTILATORS, Fine—

Kanneberg Roofing Co., Canton, O.
Stowell Mfg. & Foundry Co., South Mil-
waukee, Wis.

VENTILATORS, Hood—

Edson Mfg. Co., Boston, Mass.

**VIBRATORY AXLE SCALES—See
Scales, Vibratory Axle.****VIOLIN CLAMP SCREWS—See Screws,
Guitar and Violin Clamp.****WISE AND ANVIL—See Anvil and Vise.****WISE ATTACHMENTS—**

Tower & Lyon, 95 Chambers St., New York.

**WISE CLAMPS, JAWS—See Clamps,
Jaws.****WISE GRIPS, Pipe—**

Prentiss Vise Co., 44 Barclay St., N. Y.

WISE JAW CAPS—

Prentiss Vise Co., 44 Barclay St., N. Y.

WISES, Bicycle—

Hollands Mfg. Co., Erie, Pa.
Lewis Tool Co., 44 Barclay St., New York.
Massey Vise Co., Chicago, Ill.
Prentiss Vise Co., 44 Barclay St., N. Y.

WISES, Cabinet—

Wyman & Gordon, Worcester, Mass.

WISES, Carpenters' Wooden—

R. Bliss Mfg. Co., Pawtucket, R. I.

WISES, Coach Makers'—

Massey Vise Co., Chicago, Ill.
Chas. Parker Co., Meriden, Ct.
Van Wagoner & Williams Hardware Co.,
Cleveland, O.

WISES, Die Sinkers'—

Chas. Parker Co., Meriden, Ct.

WISES, Drill and Anvil—

Adams Co., Dubuque, Ia.
Millers Falls Co., 28 Warren St., N. Y.
Prentiss Vise Co., 44 Barclay St., N. Y.

WISES, Drill Press—

Massey Vise Co., Chicago, Ill.

WISES, Hand—

Athol Machine Co., Athol, Mass.
Billings & Spencer Co., Hartford, Ct.
Braunsdorf-Mueller Co., Elizabeth, N. J.
Goodell-Pratt Co., Greenfield, Mass.
Logan & Strobbridge Iron Co., New Brigh-
ton, Pa.
Millers Falls Co., 28 Warren St., N. Y.
Utica Drop Forge & Tool Co., Utica, N. Y.

WISES, Horseshoers'—

P. F. Burke, Boston, Mass.
Van Wagoner & Williams Hardware Co.,
Cleveland, O.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

WISES, Milling Machine—

Brown & Sharpe Mfg. Co., Providence, R. I.
Carter & Hakes Machine Co., Winsted, Ct.
Fox Machine Co., Grand Rapids, Mich.
Hill, Clarke & Co., Boston, Mass.
Massey Vise Co., Chicago, Ill.
Pratt & Whitney Co., Hartford, Ct.

WISES, Parallel—

Adams Co., Dubuque, Ia.
Athol Machine Co., Athol, Mass.
Bignall & Keeler Mfg. Co., Edwardsville,
Ill.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Lewis Tool Co., 44 Barclay St., New York.
Massey Vise Co., Chicago, Ill.
Merrill Bros., Brooklyn, N. Y.
Millers Falls Co., 28 Warren St., N. Y.
Chas. Parker Co., Meriden, Ct.
Prentiss Vise Co., 44 Barclay St., N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Van Wagoner & Williams Hardware Co.,
Cleveland, O.

WISES, Pipe—

Armstrong Mfg. Co., Bridgeport, Ct.
Bignall & Keeler Mfg. Co., Edwardsville,
Ind.
Butterfield & Co., Derby Line, Vt.
Curtis & Curtis, Bridgeport, Ct.
Exeter Machine Works, Exeter, N. H.
Hollands Mfg. Co., Erie, Pa.
Humphreys Mfg. Co., Mansfield, O.
Jarecki Mfg. Co., Erie, Pa.
Lewis Tool Co., 44 Barclay St., New York.
Massey Vise Co., Chicago, Ill.
Chas. Parker Co., Meriden, Ct.
Prentiss Vise Co., 44 Barclay St., N. Y.
Sandwich Enterprise Co., Sandwich, Ill.
D. Saunders' Sons, Yonkers, N. Y.
Tower & Lyon, 95 Chambers St., N. Y.

WISES, Planer—

Gould & Eberhardt, Newark, N. J.
Massey Vise Co., Chicago, Ill.
Pratt & Whitney Co., Hartford, Ct.

WISES, Saw—

Henry Disston & Sons, Philadelphia, Pa.
Doebler Mfg. Co., Middletown, Ct.
C. E. Jennings Co., 101 Reade St., N. Y.
John C. Kupferle, St. Louis, Mo.
Chas. Parker Co., Meriden, Ct.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

WISES, Solid Box—

Eagle Anvil Works, Trenton, N. J.
Van Wagoner & Williams Hardware Co.,
Cleveland, O.

WISES, Tubing, Polished—

Hollands Mfg. Co., Erie, Pa.

WISES, Woodworkers'—

Massey Vise Co., Chicago, Ill.

VITRIOL, Blue—

American Steel & Wire Co., Chicago, Ill.
Lewisoohn Brothers, 81 & 83 Fulton St.,
New York.

**VOLT METERS—See Meters, Record-
ing Volt.****WADS, Gun—**

Peters Cartridge Co., Cincinnati, O.
Union Metallic Cartridge Co., 313-315
Broadway, New York.

WAFFLE IRONS—See Irons, Waffle.

WAGON AND CARRIAGE MACHINERY—

Defiance Machine Works, Defiance, O.
J. A. Fay & Co., Cincinnati, O.
Williams, White & Co., Moline, Ill.

WAGON AXLES, CHAINS, &c.—See Axles, Chains, &c.**WAGONS, Delivery—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

WAGONS, Dump—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

WAGONS, MOTOR—See Carriages.**WAGONS, TOY—See Toy Carts and Wagons.****WAGON TANKS—See Tanks, Wagon, Oil, and Sprinkling.****WAGON WHEEL MACHINES—See Wheel Machines, Wagon.****WAITERS, Dumb—**

Energy Mfg. Co., Philadelphia, Pa.
Morse, Williams & Co., Philadelphia, Pa.
J. G. Spidel, Reading, Pa.
Storm Mfg. Co., Newark, N. J.
Variety Machine Co., Warsaw, N. Y.
Warner Elevator Mfg. Co., Cincinnati, O.

WAITERS, Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.

WALK SCRAPERS—See Scrapers, Walk and Street.**WALL HANGERS, SCRAPERS—See Hangers, Scrapers.****WARDROBE HOOKS—See Hooks, Coat, Hat, &c.****WARDROBES, OFFICE AND SHOP—See Lockers.****WARE, Aluminum—**

Sidney Shepard & Co., Buffalo, N. Y.

WARE, Copper—

Rome Mfg. Co., Rome, N. Y.
Sidney Shepard & Co., Buffalo, N. Y.

WARE, Enameled—

Bellair Stamping Co., Harvey, Ill.
Cleveland Stamping & Tool Co., Cleveland.
Keen & Hagerty Mfg. Co., Baltimore, Md.

WARE, Hollow, Nickel Silver—

Wm. Rogers Mfg. Co., Hartford, Ct.

WARE, Hollow, Silver and Silver Plated—

International Silver Co., 9-13 Maiden Lane, New York.
S. F. Myers Co., 48-50 Maiden Lane, N. Y.

WARE, Hollow, Steel—

Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland.
Keen & Hagerty Mfg. Co., Baltimore, Md.
New York Stamping Co., Brooklyn, N. Y.

WAREHOUSE TRUCKS—See Trucks, Store, Warehouse, &c.**WARE, Sheet Iron—**

Keen & Hagerty Mfg. Co., Baltimore, Md.
Sidney Shepard & Co., Buffalo, N. Y.

WARE, TIN—See Tinware.**WARE, Wooden—**

Hill Dryer Co., Worcester, Mass.

WARM AIR FURNACES—See Furnaces, Warm Air.**WARMERS, Plate, Pie, Cake, &c.—**

V. Clad & Sons, Philadelphia, Pa.

WASH BENCHES, STANDS—See Stands, and Benches, Tub.**WASHBOARD BLANKS—**

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

WASHBOARD KNIVES—See Knives, Machine.**WASHBOARDS—**

Saginaw Mfg. Co., Saginaw, Mich.

WASHER CUTTERS—See Cutters, Washer.**WASHER MACHINES—**

National Machinery Co., Tiffin, O.

WASHER PUNCHES—See Punches, Washer.**WASHERS AND DISKS, Rubber—See Gaskets and Rings, Rubber.****WASHERS AND STREET HYDRANTS—See Hydrants and Street Washers.****WASHERS, Brass—**

American Hardware Mfg. Co., Ottawa, Ill.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Wilson & Smith, Worcester, Mass.

WASHERS, Cast—

American Iron & Steel Mfg. Co., Lebanon, Pa.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
John C. Kupferle, St. Louis, Mo.
Henry B. Newhall, 26 Cortlandt St., N. Y.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Rockford Bolt Works, Rockford, Ill.
Stover Mfg. Co., Freeport, Ill.
Wilson & Smith, Worcester, Mass.

WASHERS, Felt—

Bowen Mfg. Co., Auburn, N. Y.

WASHERS, FLOOR—See Plates and Washers, Floor.**WASHERS, Lead—**

Littleford Bros., Cincinnati, O.

WASHERS, Leather—

Barnes Mfg. Co., Mansfield, O.
W. J. Clark Co., Salem, O.

WASHERS, Prop Block—

McKinnon Dash Co., Buffalo, N. Y.

WASHERS, Wrought—

American Hardware Mfg. Co., Ottawa, Ill.
American Iron & Steel Mfg. Co., Lebanon, Pa.
Avery Stamping Co., Cleveland, O.
W. J. Clark Co., Salem, O.
Clark & Cowles, Plainville, Ct.
Enterprise Foundry Co., Cincinnati, O.
Grand Crossing Tack Co., Chicago, Ill.
Griffin Mfg. Co., Allegheny, Pa.
Sam'l Hall's Sons, 229-233 W. 10th St., New York.
Wm. H. Haskell Mfg. Co., Pawtucket, R. I.
Jenkins Bros., 71 John St., New York.
McKinney Mfg. Co., Allegheny, Pa.
Milton Mfg. Co., Milton, Pa.
Nut & Washer Mfg. Co., Milwaukee, Wis.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Republic Iron & Steel Co., Chicago, Ill.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Works, Rockford, Ill.
Shelton Co., Derby, Ct.
Stanley Works, New Britain, Ct.
Wheeling Hinge Co., Wheeling, W. Va.
Wilson & Smith, Worcester, Mass.

WASHING AND SEPARATING MACHINERY, Ore—

Jeffrey Mfg. Co., Columbus, O.

WASHING MACHINERY, COAL—See Coal Washing Machinery.**WASHING MACHINES—**

Benbow Mfg. Co., St. Louis, Mo.
Boss Washing Machine Co., Cincinnati, O.
H. F. Brammer Mfg. Co., Davenport, Ia.
Clark, Quilen & Morse, Peoria, Ill.
Eureka Co., Rock Falls, Ill.
Famous Mfg. Co., Chicago, Ill.
Anthony Wayne Mfg. Co., Fort Wayne, Ind.

WASTE BASKETS, CANS—See Baskets, Cans.**WASTE BOXES, CAST IRON—See Boxes, Cast Iron Waste.****WASTE, COTTON—**

A. Leschen & Sons Rope Co., St. Louis, Mo.
Railway Supply Co., St. Louis, Mo.

WATCH CASES—See Cases, Watch.**WATCHMAKERS' SUPPLIES—See Jobbers', Watchmakers' Supplies.****WATCHMEN'S CLOCKS—See Clocks, Watchmen's.****WATER CLOSET HINGES—See Hinges, Water Closet Seat.****WATER COOLERS, ELEVATORS, &c.—See Coolers, Elevators, &c.****WATERERS, STOCK—See Stock Waterers.****WATER PIPE, RIVETED—See Pipe, Riveted Water.****WATER WHEELS—**

W. J. Clark Co., Salem, O.
Dubuque Machine Concern, Dubuque, Iowa.
James Leffel & Co., Springfield, O.
R. Poole & Son Co., Baltimore, Md.
Reading Foundry Co., Reading, Pa.
Craig Ridgway & Son Co., Coatesville, Pa.
R. D. Wood & Co., Philadelphia, Pa.

WATER WORKS SUPPLIES—

Ingersoll-Sergeant Drill Co., 26 Cortlandt St., New York.
Charles Millar & Son, Utica, N. Y.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

WATT METERS, RECORDING—See Meters, Recording Watt.**WAX, Fruit Can—**

Markle Lead Works, St. Louis, Mo.

WAX MELTING CUPS—See Cups, Wax Melting.**WEATHERPROOF WIRE—See Wires, Electrical.****WEAVING MACHINERY, Wire Mattress—**

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

WEB GIRTS, HALTERS—See Girts, Halters.**WEBS, Turning, Felloe, &c.—**

E. C. Atkins & Co., Indianapolis, Ind.
Henry Disston & Sons, Philadelphia, Pa.
C. E. Jennings Co., 101 Reade St., N. Y.
Millers Falls Co., 28 Warren St., N. Y.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

WEDGES, Axe—

Walter W. Woodruff & Sons Co., Mount Carmel, Pa.

WEDGES, Wood Choppers—

Van Wagoner & Williams Hardware Co., Cleveland, O.

WEEDERS, Field—

Aspinwall Mfg. Co., Jackson, Mich.

WEEDERS, Garden—

Arcade Mfg. Co., Freeport, Ill.
W. J. Clark Co., Salem, O.
Iowa Farming Tool Co., Fort Madison, Ia.

WEEDING HOOKS—See Hooks, Weeding.**WEIGHING MACHINES, Automatic, for Granular Materials—**

Pratt & Whitney Co., Hartford, Ct.

WEIGHTS, Hitching—

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
Imperial Bit & Snap Co., Racine, Wis.
John C. Kupferle, St. Louis, Mo.
Logan & Strobridge Iron Co., New Brighton, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

WEIGHTS, Paper—

Sam'l C. Tatum Co., Cincinnati, O.
Wrightsville Hardware Co., Wrightsville, Pa.

WEIGHTS, Sash—

Barney & Reed Mfg. Co., Boston, Mass.
E. E. Brown & Co., Philadelphia, Pa.
Enterprise Foundry Co., Cincinnati, O.
John C. Kupferle, St. Louis, Mo.

WEIGHTS, SCALE—See Scale Manufacturers.**WEIGHTS, Test—**

Standard Scale & Supply Co., Pittsburgh.

WELDING MACHINES, Tire—

Long & Allstatter Co., Hamilton, O.
Williams, White & Co., Moline, Ill.

WELL CHAINS, CURBS, &c.—See Chains, Curbs, &c.

WELL MACHINERY—

Dubuque Machine Concern, Dubuque, Iowa.
Flint & Walling Mfg. Co., Kendallville, Ind.

WELL SUPPLIES AND TOOLS (Points, Cylinders, Valves, Tubular Well Tools, &c.)—

Barnes Mfg. Co., Mansfield, O.
A. D. Cook, Lawrenceburg, Ind.
Deming Co., Salem, O.
Dubuque Machine Concern, Dubuque, Iowa.
Stanley G. Flagg & Co., Philadelphia, Pa.
Flint & Walling Mfg. Co., Kendallville, Ind.
Jarecki Mfg. Co., Erie, Pa.
Jenkins Bros., 71 John St., New York.
F. E. Myers & Bro., Ashland, O.
Red Jacket Mfg. Co., Davenport, Ia.
Sandwich Enterprise Co., Sandwich, Ill.

WHARF SPIKES—See Spikes, Dock, Wharf, &c.**WHEELBARROWS—See Barrows, Wheel.****WHEEL CUTTERS, Clock—**

Cross & Speirs Machine Co., Waterbury, Ct.

WHEEL MOLDING MACHINES, CAR—See Molding Machines, Car Wheel.**WHEEL MACHINES, Wagon—**

Defiance Machine Works, Defiance, O.

WHEEL PRESSES, CAR—See Presses, Car Wheel.**WHEELS—See Axles and Wheels.****WHEELS, Balance.**

Jones & Laughlins, Ltd., Pittsburgh, Pa.

WHEELS, Ball Bearing—

Atlas Bolt & Screw Co., Cleveland, O.
McCabe Hanger Mfg. Co., 532-542 W. 22d St., New York.

WHEELS, Barrow—

Bryan Mfg. Co., Bryan, O.
Havana Metal Wheel Co., Havana, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Sidney Steel Scraper Co., Sidney, O.
West Side Foundry Co., Troy, N. Y.

WHEELS, Car—

Atlas Bolt & Screw Co., Cleveland, O.
Ferro-Carbon Castings Co., Philadelphia.
Keagy & Lear Machine Co., Coshocton, O.
Henry Levis & Co., Philadelphia, Pa.
Pierson & Co., 29 Broadway, New York.
Theodore Thomas, 11 Broadway, N. Y.

WHEELS, Carborundum—

Carborundum Co., Niagara Falls, N. Y.

WHEELS, CHILLED CAR—See Car Wheels, Chilled.**WHEELS, Corundum—**

L. Best, 45 Vesey St., New York.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Northampton Emery Wheel Co., Leeds, Mass.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.
Star Corundum Wheel Co., Detroit, Mich.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Vitrified Emery Wheel Co., Westfield, Mass.

WHEELS, Dental—

Pike Mfg. Co., Pike Station, N. H.

WHEELS, Emery—

American Emery Wheel Works, Boston.
L. Best, 45 Vesey St., New York.
Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Diamond Machine Co., Providence, R. I.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Safety Emery Wheel Co., Springfield, O.
Scranton Corundum & Emery Wheel Co., Scranton, Pa.
Springfield Mfg. Co., Bridgeport, Ct.
Star Corundum Wheel Co., Detroit, Mich.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Tanite Co., Stroudsburg, Pa.
Vitrified Wheel Co., Westfield, Mass.

WHEELS, Fifth—

E. D. Clapp Mfg. Co., Auburn, N. Y.
Richard Eccles, Auburn, N. Y.
Scranton Forging Co., Scranton, Pa.

WHEELS, Grinding, for Sewing Machines—

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

WHEELS, Measuring, Tire—

Wiley & Russell Mfg. Co., Greenfield, Mass.

WHEELS, Polishing—

Bridgeport Safety Emery Wheel Co., Bridgeport, Ct.
Diamond Machine Co., Providence, R. I.
Divine Bros. Co., Utica, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Osborn Mfg. Co., Cleveland, O.
Springfield Mfg. Co., Bridgeport, Ct.
Sterling Emery Wheel Mfg. Co., Tiffin, O.
Zucker & Levett & Loeb Co., 526-530 West 25th St., New York.

WHEELS, Propeller—

Truscott Boat Mfg. Co., St. Joseph, Mich.

WHEELS, Roll Grinding—

Carborundum Co., Niagara Falls, N. Y.

WHEELS, Rubber Tired—

Kilbourne & Jacobs Mfg. Co., Columbus, O.

WHEELS, Sprocket—

Aultman Co., Canton, O.
Bethlehem Foundry & Machine Co., South Bethlehem, Pa.
Boston Gear Works, Boston, Mass.
Buhl Malleable Co., Detroit, Mich.
Geo. V. Cresson Co., Philadelphia, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Heyl & Patterson, Pittsburgh, Pa.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Philadelphia.
Henry B. Newhall, 26 Cortlandt St., N. Y.
T. F. Welch Mfg. Co., Boston, Mass.

WHEELS, Steam Valve—

Sawyer Tool Co., Fitchburg, Mass.
Troy Nickel Works, Albany, N. Y.

WHEELS, Tracing—

Arcade Mfg. Co., Freeport, Ill.
Billings & Spencer Co., Hartford, Ct.

WHEELS, Truck—

Wm. Bayley & Sons Co., Milwaukee, Wis.
Havana Metal Wheel Co., Havana, Ill.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
R. W. Whitehurst & Co., Norfolk, Va.

WHEELS, Vehicle—

Havana Metal Wheel Co., Havana, Ill.

WHEELS, WATER—See Water Wheels.**WHEELS, Well—**

John C. Kupferle, St. Louis, Mo.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Reading Hardware Co., Reading, Pa.
Wrightsville Hardware Co., Wrightsville, Pa.

WHIP SOCKETS—See Sockets, Whip.**WHISK BROOMS, &c.—See Brooms, Whisk, &c.****WHISTLE CORD HOOKS—See Hooks, Whistle Cord.****WHISTLES, Alarm—**

Lunkenheimer Company, Cincinnati, O.
W. R. Ostrander & Co., 22 Dey St., N. Y.

WHISTLES, Steam—

Ashton Valve Co., Boston, Mass.
Crosby Steam Gate & Valve Co., Boston.
Lunkenheimer Company, Cincinnati, O.
McNab & Harlin Mfg. Co., 56 John St., New York.

WHITE BRASS—See Brass, White.**WHITE LEAD MACHINERY—**

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Geo. V. Cresson Co., Philadelphia, Pa.
R. Poole & Son Co., Baltimore, Md.

WHITENASH BRUSHES—See Brushes, Whitewash, Horse, &c.**WICK, Candle—**

A. Leschen & Sons Rope Co., St. Louis, Mo.

WICKETS, RAILING—See Iron, Ornamental.**WINCHES—**

Edson Mfg. Co., Boston, Mass.

WINDING MACHINES—

Fairmount Machine Co., Philadelphia, Pa.

WINDING MACHINES, BOBBIN—See Bobbin Winding Machines.**WINDLASSES—**

Thos. Carlin's Sons, Allegheny, Pa.
Edson Mfg. Co., Boston, Mass.

WIND MILL PUMPS, REGULATORS, TANKS—See Pumps, Regulators, Tanks.**WIND MILLS—See Mills, Wind.****WINDOW ANTI-RATTLERS, BRUSHES, &c.—See Anti-Rattlers, Brushes, &c.****WINDOW CAPS—See Caps, Door and Window, Sheet Iron.****WINDOW SCREEN FASTENERS, FRAMES—See Fasteners, Frames.****WINDOW SPRING BOLTS—See Bolts, Window Spring.****WINDOWS, Reversible—**

Phenix Mfg. Co., Milwaukee, Wis.

WINDOW STOP ADJUSTERS—See Adjusters, Window Stop.**WINDOW VENTILATING BOLTS—See Bolts, Window Ventilating.****WINE PITCHERS—See Pitchers, Silver Plated.****WINSHURST ELECTRICAL MACHINES—See Electrical Machines, Static.****WIRE, Aluminum—**

American Steel & Wire Co., Chicago, Ill.
Pittsburgh Reduction Co., Pittsburgh, Pa.
Scovill Mfg. Co., Waterbury, Ct.

WIRE, Awl—

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRE, Baling—

American Steel & Wire Co., Chicago, Ill.
Dillon-Grissold Wire Co., Sterling, Ill.
Grand Crossing Tack Co., Grand Crossing, Ill.
Morgan Spring Co., Worcester, Mass.

WIRE, Barb—

American Steel & Wire Co., Chicago, Ill.
Dillon-Grissold Wire Co., Sterling, Ill.
Ludlow-Saylor Wire Co., St. Louis, Mo.

WIRE BASKET HANDLES—See Handles, Basket, Wire.**WIRE, Bicycle Spoke—**

American Steel & Wire Co., Chicago, Ill.
Morgan Spring Co., Worcester, Mass.
R. H. Wolff & Co., Foot 116th St., N. Y.

WIRE, Bolt—

American Steel & Wire Co., Chicago, Ill.
Morgan Spring Co., Worcester, Mass.

WIRE, Bottling, Book Binder, &c.—

American Steel & Wire Co., Chicago, Ill.

WIRE, Brass and Copper—

American Steel & Wire Co., Chicago, Ill.
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
Hazard Mfg. Co., Wilkes-Barre, Pa.
Hendricks Bros., 45 Cliff St., New York.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Lewishohn Brothers, 81 and 83 Fulton St., New York.
Merchant & Co., Philadelphia, Pa.
Michigan Wire Cloth Co., Detroit, Mich.
Plume & Atwood Mfg. Co., Waterbury, Ct.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.
E. H. Stroud & Co., Chicago, Ill.
Waterbury Brass Co., Waterbury, Ct.
Wright & Colton Wire Cloth Co., Worcester, Mass.

WIRE, Brass Pinion—

Ansonia Brass & Copper Co., 19 Cliff St., New York.
Boston Gear Works, Boston, Mass.

WIRE BRUSHES—See Brushes, Wire.**WIRE, Cast Steel—**

Crescent Steel Co., Pittsburgh, Pa.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
New Haven Wire Mfg. Co., New Haven, Ct.
R. H. Wolff & Co., Foot 116th St., N. Y.

WIRE, Check Rower—

American Steel & Wire Co., Chicago, Ill.

WIRE CHISELS, COILERS, &c.—See Chisels, Coilers, &c.**WIRE, Clock Spring—**American Steel & Wire Co., Chicago, Ill.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE CLOTH—See Cloth.****WIRE CLOTH FLOORS, HOLDERS—See Floors, Holders.****WIRE, Cord—**

American Steel & Wire Co., Chicago, Ill.

WIRE, Cotter—

American Steel & Wire Co., Chicago, Ill.

WIRE CUTTING MACHINES—See Cutting Machines, Wire.**WIRE, Dental—**

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRE DRAW BENCHES—See Draw Benches, Wire.**WIRE, Flat—**American Steel & Wire Co., Chicago, Ill.
New Haven Wire Mfg. Co., New Haven, Ct.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE FLATTENING MILLS—**

Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.

WIRE FUSE—See Fuse, Wire.**WIRE, German Silver—**Scovill Mfg. Co., Waterbury, Ct.
Waterbury Brass Co., Waterbury, Ct.**WIRE, Gimlet—**

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRE GOODS, Bright—American Steel & Wire Co., Chicago, Ill.
M. S. Brooks & Sons, Chester, Ct.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Ossawan Mills Co., Norwich, Ct.
Wire Goods Co., Worcester, Mass.**WIRE GOODS, Mill—**M. S. Brooks & Sons, Chester, Ct.
E. Jenckes Mfg. Co., Pawtucket, R. I.
Wire Goods Co., Worcester, Mass.**WIRE GOODS, to order—**R. C. Jenkinson & Co., Newark, N. J.
E. Jenckes Mfg. Co., Pawtucket, R. I.**WIRE, Heddle—**American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
National Wire Co., New Haven, Ct.**WIRE, Iron and Steel, Market, Fence, Stone, &c.—**American Steel & Wire Co., Chicago, Ill.
Dillon-Griswold Wire Co., Sterling, Ill.
Frost Wire Fence Co., Cleveland, O.
Grand Crossing Tack Co., Grand Crossing, Ill.
Kilmer Mfg. Co., Chicago, Ill.
Michigan Wire Cloth Co., Detroit, Mich.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.
New Haven Wire Mfg. Co., New Haven, Ct.
Geo. W. Prentiss & Co., Holyoke, Mass.
Reading Screw Co., Norristown, Pa.
Stewart Wire Co., Easton, Pa.
C. E. & E. P. Townsend, New Brighton, Pa.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
R. H. Wolff & Co., Foot 116th St., N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.**WIRE KITCHEN ARTICLES—See Kitchen Articles, Wire.****WIRE, Knarled—**

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRE, Lock, Hat, Brush and Curtain—National Wire Co., New Haven, Ct.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE MILL PLANTS—**Braddock Machine & Mfg. Co., Braddock, Pa.
Morgan Construction Co., Worcester, Mass.
Hugh L. Thompson, Waterbury, Ct.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
Waterbury Farrel Foundry & Machine Co., Waterbury, Ct.**WIRE, Music—**American Steel & Wire Co., Chicago, Ill.
Trenton Iron Co., Trenton, N. J.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE, Needle—**American Steel & Wire Co., Chicago, Ill.
Hobson, Houghton & Co., 98 John St., New York.
Jonas & Colver Continental Steel Works, 101 Duane St., New York.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
R. H. Wolff & Co., Foot 116th St., N. Y.
Wheelock, Lovejoy & Co., 23 Cliff St., N. Y.**WIRE NETTING RACKS—See Racks, Wire Netting.****WIRE PARTS, Shaped—**

R. C. Jenkinson & Co., Newark, N. J.

WIRE, Picture—National Wire Co., New Haven, Ct.
See also Cord, Wire, Picture.**WIRE, Pin—**American Steel & Wire Co., Chicago, Ill.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.**WIRE, Rivet—**American Steel & Wire Co., Chicago, Ill.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.**WIRE ROD REELS—See Reels, Wire Rod.****WIRE RODS—See Rods, Wire.****WIRE, Rope—**R. H. Wolff & Co., Foot 116th St., N. Y.
See Rope, Wire.**WIRE ROPE CLAMPS, CLIPS, &c.—See Clamps, Clips, &c.****WIRE, Round, Tempered—**American Steel & Wire Co., Chicago, Ill.
New Haven Wire Mfg. Co., New Haven, Ct.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE, Screw—**Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
Morgan Spring Co., Worcester, Mass.**WIRE, Screw Driver—**

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRES, Electrical—American Steel & Wire Co., Chicago, Ill.
Ansonia Brass & Copper Co., 19-21 Cliff St., New York.
Bridgeport Brass Co., Bridgeport, Ct.
General Electric Co., Schenectady, N. Y.
Hendricks Bros., 49 Cliff St., New York.
U. T. Hungerford Brass & Copper Co., 121 Worth St., New York.
Lewishohn Bros., 81-83 Fulton St., N. Y.
Plume & Atwood Co., 29 Murray St., N. Y.
Randolph-Clowes Co., Waterbury, Ct.
Arthur T. Rutter, 256 Broadway, N. Y.
Scovill Mfg. Co., Waterbury, Ct.
Waterbury Brass Co., Waterbury, Ct.
Wright & Colton Wire Cloth Co., Worcester, Mass.**WIRE SHAPES TO ORDER—**Morgan Spring Co., Worcester, Mass.
E. H. Titchener & Co., Binghamton, N. Y.**WIRE, Soft, Coppered, Bright and Annealed—**American Steel & Wire Co., Chicago, Ill.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.**WIRE, Special—**American Steel & Wire Co., Chicago, Ill.
Bridgeport Brass Co., Bridgeport, Ct.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.
New Haven Wire Mfg. Co., New Haven, Ct.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Geo. W. Prentiss & Co., Holyoke, Mass.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE SPECIALTIES—**

R. C. Jenkinson & Co., Newark, N. J.

WIRE, Spooled—American Steel & Wire Co., Chicago, Ill.
Ansonia Brass & Copper Co., 19 Cliff St., New York.
Malin & Co., Cleveland, O.
Ossawan Mills Co., Norwich, Ct.
Wire Goods Co., Worcester, Mass.
Wright & Colton Wire Cloth Co., Worcester, Mass.**WIRE, Spring—**American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
Morgan Spring Co., Worcester, Mass.
National Wire Co., New Haven, Ct.**WIRES, Tempered, Cast Steel—**American Steel & Wire Co., Chicago, Ill.
Cleveland Wire Spring Co., Cleveland, O.
Morgan Spring Co., Worcester, Mass.**WIRE STITCHING MACHINES—**

R. H. Brown & Co., New Haven, Ct.

WIRE STRAIGHTENING AND CUTTING MACHINES—See Straightening and Cutting Machines, Wire.**WIRE, Strand, Guy, Galvanized—**

American Steel & Wire Co., Chicago, Ill.

WIRE, Tack—

American Steel & Wire Co., Chicago, Ill.

WIRE, Tape Line—

R. H. Wolff & Co., Foot 116th St., N. Y.

WIRE TRAYS, PAPER—See Trays, Wire, Paper.**WIRE, Umbrella—**American Steel & Wire Co., Chicago, Ill.
National Wire Co., New Haven, Ct.
R. H. Wolff & Co., Foot 116th St., N. Y.**WIRE, Watch—**

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRE WINDOW GUARDS—See Guards, Wire Window.**WIRE, Wood Bit—**

Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.

WIRE WORK, to order—E. T. Barnum, Detroit, Mich.
J. E. Bolles Iron & Wire Works, Detroit, Mich.
Columbus Wire & Iron Works, Columbus, O.
Edward Darby & Sons, Philadelphia, Pa.
Forest City Steel & Iron Co., Cleveland, O.
R. C. Jenkinson & Co., Newark, N. J.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Fred. J. Meyers Mfg. Co., Hamilton, O.
Michigan Wire Cloth Co., Detroit, Mich.
Scheeler's Sons, Buffalo, N. Y.
Van Dorn Iron Works Co., Cleveland, O.**WOOD ENGRAVING—See Engraving, Photo and Wood.****WOODEN MALLETS, SCOOPS, SHOVELS—See Mallets, Scoops, Shovels.****WOODEN SPECIALTIES—**

John Sommer's Son, Newark, N. J.

WOODEN WARE—See Ware, Wooden.**WOOD FAUCETS, MEASURES, &c.—See Faucets, Measures, &c.****WOOD SAWING MACHINES—See Sawing Machines, Wood.****WOODS, ELECTRIC—See Electric Woods.****WOOD TURNERS' TOOLS—See Tools, Wood Turners'.****WOOD TURNINGS—See Turnings, Wood, to Order.****WOOD WORKERS, Universal—**

Egan Co., Cincinnati, O.

WOOD WORKING MACHINES—American Machinery Co., Grand Rapids, Mich.
Defiance Machine Co., Defiance, O.
Egan Co., Cincinnati, O.
Fox Machine Co., Grand Rapids, Mich.
Niles Tool Works Co., Hamilton, O.
Pennsylvania Machinery Co., Philadelphia, Pa.
Josiah Ross, Buffalo, N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
Frank Toomey, Philadelphia, Pa.
Wickes Bros., Saginaw, Mich.
Williams, White & Co., Moline, Ill.

WORK BENCHES—See Benches, Work.**WORM GEARING—**

J. B. & J. M. Cornell, 26th St. & 11th Ave., New York.
Geo. V. Cresson Co., Philadelphia, Pa.
Robert Poole & Son Co., Baltimore, Md.

WRAPPING PAPER HOLDERS AND CUTTERS—See Holders and Cutters, Roll Paper.**WRECKING MACHINERY, Railroad—**
Vulcan Iron Works, Chicago, Ill.**WRENCH ATTACHMENTS, Pipe—**

Prentiss Vise Co., 44 Barclay St., N. Y.
Star Mfg. Co., Carpentersville, Ill.
L. S. Starrett Co., Athol, Mass.

WRENCHES, Adjustable & Pipe—

Bemis & Call Hdw. & Tool Co., Springfield, Mass.

WRENCHES, Bicycle and Pocket—

Billings & Spencer Co., Hartford, Ct.
Bridgeport Gun Implement Co., 313 Broadway, N. Y.
Sam'l Hall's Sons, 229-233 W. 10th St., New York.
C. E. Jennings Co., 101 Reade St., N. Y.
Frank Mossberg Co., Attleboro, Mass.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Springfield Drop Forging Co., Springfield, Mass.
Star Mfg. Co., Carpentersville, Ill.
Tower & Lyon, 95 Chambers St., New York.
J. H. Williams & Co., Brooklyn, N. Y.

WRENCHES, Brace—

Braunsdorf-Mueller Co., Elizabeth, N. J.

WRENCHES, Carriage—

Goodell Co., Antrim, N. H.
Logan & Strobbridge Iron Co., New Brighton, Pa.
Millers Falls Co., 28 Warren St., N. Y.
Tower & Lyon, 95 Chambers St., N. Y.

WRENCHES, Chain—

Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams & Co., Brooklyn, N. Y.

WRENCHES, Drop Forged—

Billings & Spencer Co., Hartford, Ct.
Keystone Drop Forge Co., Philadelphia, Pa.
Rhode Island Tool Co., Providence, R. I.
Transue & Williams Co., Alliance, O.
J. H. Williams & Co., Brooklyn, N. Y.
Wilson & Smith, Worcester, Mass.

WRENCHES, Malleable T—

W. J. Clark Co., Salem, O.

WRENCHES, Nipple—

Bevin Bros. Mfg. Co., Easthampton, Ct.

WRENCHES, Pipe—

Armstrong Mfg. Co., Bridgeport, Ct.
Belden Machine Co., New Haven, Ct.
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings & Spencer Co., Hartford, Ct.
Hollands Mfg. Co., Erie, Pa.
Iver Johnson's Arms & Cycle Works, Fitchburg, Mass.
Tower & Lyon, 95 Chambers St., New York.
Transue & Williams Co., Alliance, O.
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams & Co., Brooklyn, N. Y.
Wire Goods Co., Worcester, Mass.

WRENCHES, Screw (Mechanics', Agricultural, &c.)—

Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings & Spencer Co., Hartford, Ct.
Coes Wrench Co., Worcester, Mass.
Gould & Eberhardt, Newark, N. J.
Wm. G. Le Count, South Norwalk, Ct.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Springfield Drop Forging Co., Springfield, Mass.
Star Mfg. Co., Carpentersville, Ill.
Tower & Lyon, 95 Chambers St., New York.
Transue & Williams Co., Alliance, O.

WRENCHES, Socket—

Smith & Egge Mfg. Co., Bridgeport, Ct.

WRENCHES, Tap—

Braunsdorf-Mueller Co., Elizabeth, N. J.

WRENCHES, Tap and Reamer—

Armstrong Mfg. Co., Bridgeport, Ct.
Billings & Spencer Co., Hartford, Ct.
Butterfield & Co., Derby Line, Vt.
S. W. Card Mfg. Co., Mansfield, Mass.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., Hartford, Ct.
Springfield Machine Screw Co., Springfield, Mass.
Standard Tool Co., Cleveland, O.
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

WRENCHES, Trap—

Onelda Community, Niagara Falls, N. Y.

WRINGERS, Clothes—

North Bros. Mfg. Co., Philadelphia, Pa.

WRINGERS, Mop—

Beach Novelty Co., Mansfield, O.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

WRIST PIN TURNING MACHINES—

Pedrick & Ayer Co., Philadelphia, Pa.

WROUGHT IRON GOODS, HOOKS, STAPLES, &c.—

McKinney Mfg. Co., Allegheny, Pa.
Ney Mfg. Co., Canton, O.
Stanley Works, New Britain, Ct.
W. & J. Tiebout, 118 Chambers St., N. Y.
Wheeling Hinge Co., Wheeling, W. Va.
Wire Goods Co., Worcester, Mass.

WROUGHT IRON SPECIALTIES—

Wheeling Hinge Co., Wheeling, W. Va.

WROUGHT STEEL BUTTS, SINKS, &c.—See Sinks, Butts, &c.**WROUGHT WASHERS—See Washers, Wrought.****YACHT HARDWARE—**

W. & J. Tiebout, 118 Chambers St., N. Y.

YACHTS, Kerosene Engine—

Daimler Mfg. Co., Long Island City, N. Y.

YARD MEASURE, Steel—

Brown & Sharpe Mfg. Co., Hartford, Ct.

YARNS, Spun and Tarred—

Waterbury Rope Co., 69 South St., N. Y.

YELLOW METAL NAILS—See Sheathing Nails, &c., Yellow Metal.**YOKES, Neck, Trimmed—**

Covert's Saddlery Works Farmer, N. Y.
Imperial Bit & Snap Co., Racine, Wis.
Walter W. Woodruff & Sons Co., Mount Carmel, Ct.

YOKES, Ox—

Iowa Farming Tool Co., Fort Madison, Ia.

ZINC BATTERY PLATES—See Battery Plates, Rolled Zinc.**ZINC FOR LECLANCHE BATTERIES—**

Matthiessen & Hegeler Zinc Co., La Salle, Ill.
W. R. Ostrander & Co., 22 Dey St., N. Y.

ZINC, Nickel—

American Nickeloid Co., Peru, Ill.

ZINC, Nickelized Sheet—

American Nickeloid Co., Peru, Ill.

ZINC PLATES—

E. Phillips & Sons, So. Hanover, Mass.

ZINC, Sheet—

Illinois Zinc Co., Peru, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

ZINC TACKS, TUBING—See Tacks, Tubing.

Pub

Vol

Read
Alph
Class
Adve



Whe
LAND, C
OR NEW
PLATES
AND GET

Brist

See
THE
SA

SANSON

RM
Cleveland

DR

MER

CO

Am

Cor

Mar

and

Batt

New